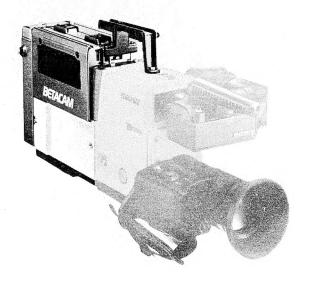
SONY

PORTABLE VIDEOCASSETTE RECORDER

BVV-1



OPERATION AND MAINTENANCE MANUAL 4th Edition Serial No. 50001 to 50030

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The operation of the Betacam system is described in the operation and maintenance manual of the camera. Please refer to it for details.

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SECTION 1 OPERATION

The BVV-1 is a compact and lightweight portable video cassette recorder which, together with a Sony portable color video camera such as the BVP-1, BVP-3, BVP-3A, BVP-30, makes up the Betacam system for ENG (Electronic News Gathering). The easy-to-operate Betacam system makes one-man camera recording possible.

1-1. FEATURES

Compact and lightweight

The BVV-1, BVP-1 camera, battery and cassette tape weigh only about 8 kg.

High-quality picture

A newly-developed recording system using 1/2-inch cassette tape for Beta-format has greatly improved the picture quality, which now approaches the quality of the 1-inch VTR picture.

Video and audio confidence

The video and audio confidence system makes it possible to check the recording picture and sound.

Built-in time code generator

A built-in time code generator allows simultaneous recording of the time code during operation. The user bit can also be recorded.

Independent time code track

The time code track is independent of the video track so that time code recording or erasing is possible using an editing control unit.

Composite shooting

Videocassette programs can be composed shot-by-shot without any glitches between scenes because vertical-interval timing with a tape back-up feature guarantees a clean cut every time.

Rewind function

A HG-20 videocassette tape can rewind within 150 seconds.

Speaker for monitoring audio

A built-in speaker allows you to monitor the sound being recorded without connecting an earphone. The volume is adjustable.

Warning lamps

The RF, SERVO, HUMID, SLACK, TAPE END and BATTERY lamps allow you to monitor the operation. If there is a problem, an alarm is sounded simultaneously from the speaker and earphone.

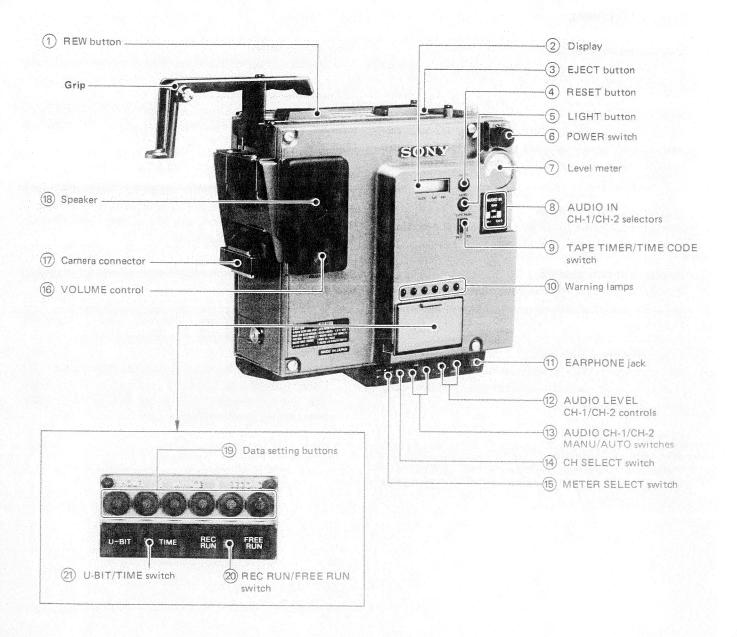
Dolby NR* (Noise Reduction) C-type system for improving sound quality

The newly developed C-type Dolby NR system is employed for an improved S/N ratio and wider dynamic range. To activate the Dolby NR circuit, refer to section 2.

* "Dolby" and the double-D symbol are trade marks of the Dolby Laboratories Licensing Corporation. Noise reduction system manufactured under license from Dolby Laboratories Licensing Corporation.

1-2. LOCATION AND FUNCTION OF PARTS

1-2-1. Operation Panel



1) REW (rewind) button

Slide in the direction of the arrow with the CAMERA/VTR switch on the camera set to SAVE and the tape will rewind as long as the button is held. When the CAMERA/VTR switch is set to STBY, the tape cannot be rewound.

- When the VTR is in the record mode, the REW button does not function.
- When the tape is fully rewound, the motor will stop even if the REW button is pushed in.

2 Display section

This indicates the tape run time, the time code or the user bit, depending on the setting of the TAPE TIMER/TIME CODE switch (9) and the U-BIT/TIME switch (21).

TAPE TIMER mode



TIME CODE mode



(3) EJECT button

Slide in the direction of the arrow and the cassette compartment will open.

4 RESET button

To reset the counter to "00 00 00", press this button after setting the display in the TAPE TIMER mode.

(5) LIGHT button

The display is illuminated as long as this button is pressed.

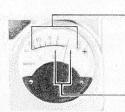
(6) POWER switch

This is the main power switch. Set to ON, and the power to the VTR and the camera will be turned on and off depending on the position of the CAMERA/VTR switch on the camera. For details, refer to the instruction manual furnished with the camera.

To turn the power off, set the switch to OFF.

(7) Level meter

This indicates the audio level or battery condition depending on the position of the METER SELECT switch (15).



Audio level of the channel selected by the CH SELECT switch (14).

-Battery condition.

8 AUDIO IN CH-1/CH-2 selectors

Select the sound source to be recorded on audio channel 1 or channel 2.

CAM: The sound from the built-in microphone.

MIC: The sound from the microphone connected to the AUDIO IN connectors.

LINE: The audio line source connected to the AUDIO IN connectors.

(9) TAPE TIMER/TIME CODE switch

Selects the indication on the display.

TAPE TIMER: Tape run time.

TIME CODE: The time code generated by the built-in time code generator or the user bit.

10 Warning lamps

RF lamp

Blinks to indicate that the video head is clogged or that the recording cannot be made because of trouble in the recording circuit.

SERVO lamp

Blinks to indicate that the drum servo is not locked.

• The lamp may momentarily blink when the tape starts running but this is not a problem.

HUMID lamp

Lights to indicate that the moisture has condensed on the head drum.

SLACK lamp

Blinks to indicate that the tape is slack between the capstan and the take-up reel. The tape automatically stops to prevent the tape from becoming entangled in the transport system.

TAPE END lamp

Blinks when the tape ends.

BATTERY lamp

Blinks when the voltage of the NP-1 battery pack falls below $11.45\,\mathrm{V}$, and lights when the voltage falls to $11.0\,\mathrm{V}$. The tape automatically stops.

(11) EARPHONE jack (mini jack)

Connect an 8-ohm earphone. During recording, simultaneous playback sound (mixed sound of channel 1 and 2) can be monitored. In the other modes, the E-to-E sound selected by the AUDIO IN selectors 8 and the CH SELECT switch 4 can be heard.

The warning sound corresponding to the warning lamps is also heard. When an earphone is connected, the sound from the speaker is cut off.

12 AUDIO LEVEL CH-1/CH-2 controls

These adjust the audio recording level when the AUDIO MANU/AUTO switch (13) is set to MANU. The CH-1 control adjusts audio channel 1 and the CH-2 control adjusts audio channel 2.

13 AUDIO CH-1/CH-2 MANU/AUTO switches

MANU: To adjust the audio recording level manually.

AUTO: To adjust the audio recording level automatically.

(14) CH SELECT switch

Selects the audio channel to be displayed on the level meter or the channel to be heard from the speaker or the earphone.

CH-1: Audio channel 1.

MIX: Mixed sound of audio channels 1 and 2.

CH-2: Audio channel 2

During recording, the meter displays the E-to-E sound level and the simultaneous playback sound can be heard from the speaker or the earphone.

15 METER SELECT switch

Selects the display for the level meter.

AUDIO: The sound level of the channel selected by the CH SELECT switch (14) is displayed.

BATT: The approximate voltage of the NP-1 battery pack installed or the power source connected to the DC IN 12 V connector is displayed.

(16) VOLUME control

This adjusts the sound level from the speaker or earphone. Turning the control to MAX increases the sound volume. At the MIN position, no sound can be heard.



(17) Camera connector (50 pin)

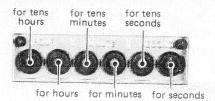
Connect to the 50-pin connector on the camera or other equipment.

18 Speaker

During recording, simultaneous playback sound (mixed sound of the audio channels 1 and 2) can be monitored. In other mode, the E-to-E sound selected by the AUDIO IN selectors 8 and the CH SELECT switch 14 can be heard. The sound corresponding to the warning lamps is also heard. When an earphone is connected to the EARPHONE jack 11, the sound from the speaker is cut off.

19 Data setting buttons

Press to set the time code or the user bit.



20 REC RUN/FREE RUN switch

REC RUN: The time code is generated only in the record mode. A continuous time code can be recorded throughout the tape. To set the time code or the user bit, be sure to use this position.

FREE RUN: The time code is always generated independent of the mode of the VTR. To record the actual time as the time code data, for example, use this position.

 When the VTR is in the FREE RUN mode, do not set this switch to REC RUN position, or the correct time code will not be obtained.

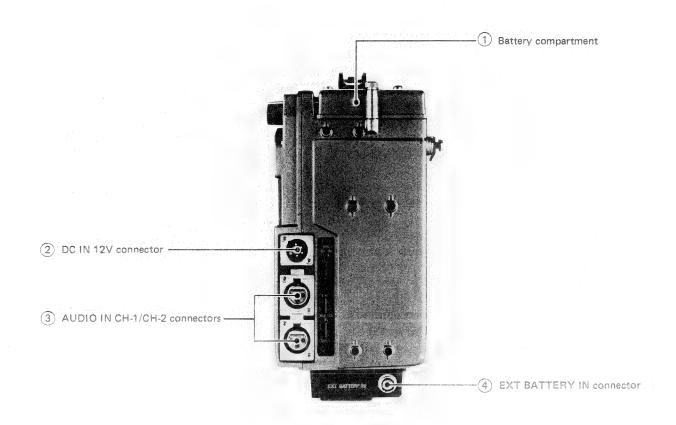
(21) U-BIT/TIME switch

U-BIT: To set the user bit or to display the user bit.

TIME: To set the time code or to display the time code.

 When the user bit is being set, the time code is not generated because the REC RUN/FREE RUN switch is set to REC RUN. So the user bit should be set before setting the time code.

1-2-2. Connector Panel



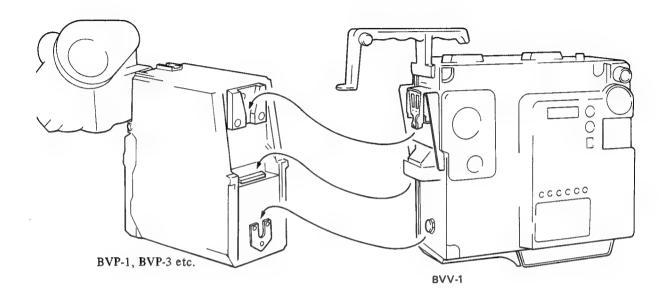
- 1 Battery compartment Insert a NP-1 battery pack.
- ② DC IN 12 V connector (XLR 4 pin)
 To operate the unit on ac power, connect the dc power cord of an AC-500 ac adaptor.
 - 1. GND
 2.
 3.

- 3 AUDIO IN CH-1/CH-2 connectors (XLR 3 pin)
 Connect external microphones or other audio equipment.
- (4) EXT.BATTERY IN connector Connect the dc power cord of a DC-100 battery adaptor (optional).

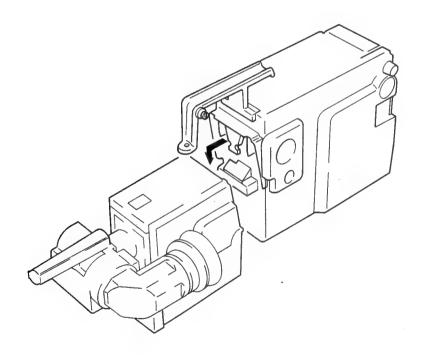
1-3. SET UP

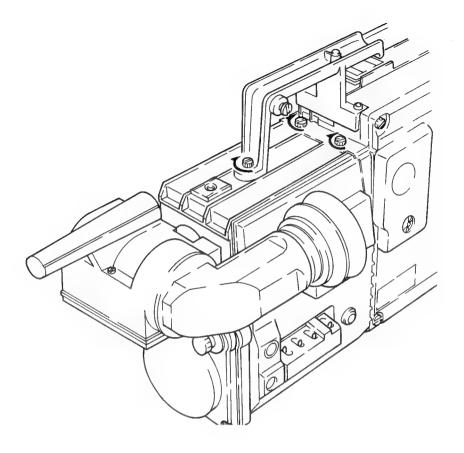
1-3-1. How to Assemble the VTR and the Camera

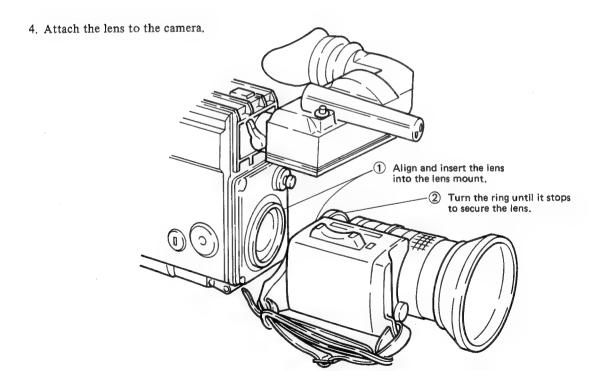
1.



2.



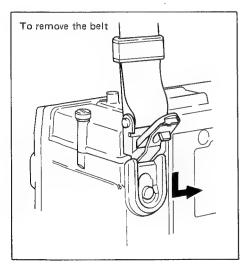




• For details on the lens, refer to the operation manual furnished with the lens.

1-3-2. How to Attach the Shoulder Belt





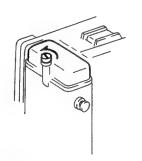
1-4. POWER SOURCES

Operate this set with an NP-1 rechargeable battery pack or with an AC-500 ac power adaptor.

1-4-1. Battery Installation

A fully-charged battery provides approximately 50 minutes of continuous operation when the BVP-1 video camera is used together. Install a NP-1 battery pack as follows.

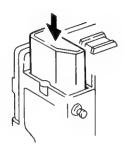
 Loosen the screw of the battery compartment and remove the lid.



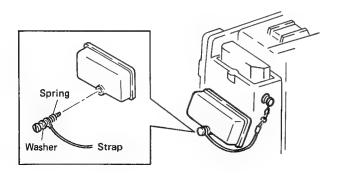
Notes on battery

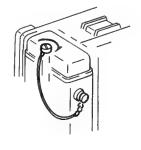
- Be sure to recharge the battery pack before every use.
 The charging time is about 1 hour at normal temperatures.
- When the NP-1 battery pack is installed, the power is always supplied to the time code circuit even if the POWER switch is set to OFF. Remove the battery pack from the battery compartment when the set will not be used for a long period of time.
- The battery pack may not charge if you try to recharge it immediately after it has been used. If this happens, wait for a few minutes before recharging it.

2. Insert a battery pack as illustrated.



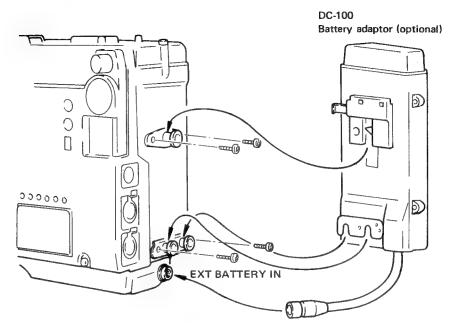
3. Attach the lid strap (supplied), replace the lid and tighten the screw.





1-4-2. Extra Battery

An extra battery installed in an DC-100 battery adaptor (optional) can be used to provide longer operation.

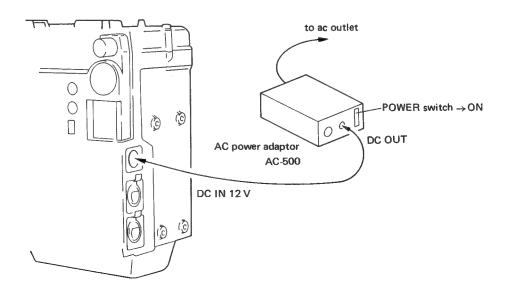


1-4-3. Charging the Battery Pack

Before operating the set, always charge the battery pack using the BC-1W battery charger. For details on charging, please read the instruction manual of the BC-1W.

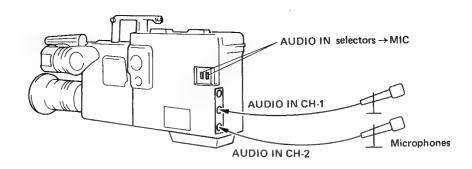
1-4-4. On AC Power

Connect the AC-500 ac power adaptor as illustrated.



1-5. CONNECTIONS

1-5-1. Audio Recording from External Microphones

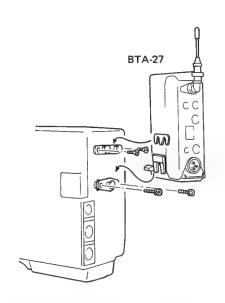


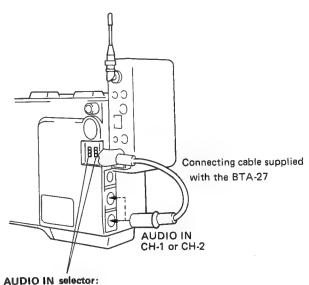
1-5-2. Audio Recording Using a Wireless Microphone

Audio recording can also be made using the Sony wireless microphone system: WRR-27 UHF portable tuner, WRT-27 transmitter, WRT-57 wireless microphone, etc.

Attach the WRR-27 portable tuner in its case (optional), as illustrated. The WRR-27 can also be attached at the rear of the DC-100 battery adaptor, in the same way as well.

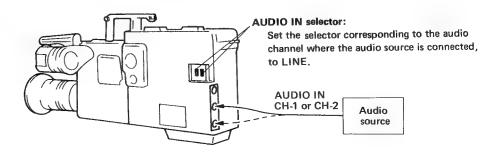
• For details on the wireless microphone system, see the instruction manual furnished with each unit.





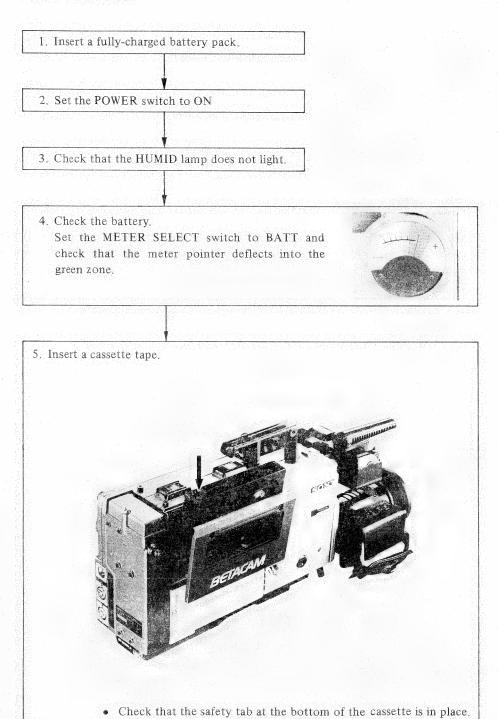
Set the selector corresponding to the audio channel where the portable tuner is connected, to MIC.

1-5-3. Audio Recording from Another Equipment



1-6. OPERATION CHECK AND ADJUSTMENT

1-6-1. Preparation



1-6-2. Check of the VTR

Proceed 1 through 5 continuously.

1. Check the tape transport

- 1. Set the TAPE TIMER/TIME CODE switch to TAPE TIMER.
- 2. Press the VTR START button.

Check that:

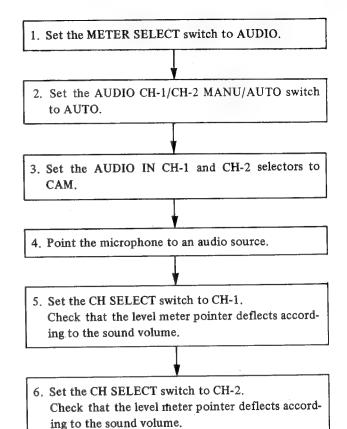
- · The tape runs.
- The figures on the display changes as the tape
- The REC lamp in the viewfinder lights.
- The RF and SERVO lamps do not light.
- Press the VTR START button again.
 Check that the tape stops and the REC lamp in the viewfinder goes off.
- 4. Press the VTR button of the lens.

Check that:

- The tape runs.
- The figures on the display changes as the tape runs.
- The REC lamp in the viewfinder lights.
- The RF and SERVO lamps do not light.
- Press the VTR button again.
 Check that the tape stops and the REC lamp in the viewfinder goes off.
- 6. Press the RESET button.

 Check that the display indicates "00 00 00".
- 7. Press the LIGHT button. The display is illuminated.

2. Check the automatic audio recording level adjustment.



3. Check the manual audio recording level adjustment

1. Set the AUDIO CH-1/CH-2 MANU/AUTO switch to MANU.

2. Turn the AUDIO LEVEL CH-2 control clockwise. Check that the level meter pointer deflects.

3. Set the CH SELECT switch to CH-1.

4. Turn the AUDIO LEVEL CH-1 control clockwise. Check that the level meter pointer deflects.

5. Set the AUDIO switch to AUTO.

5. Check the audio confidence function

1. Set the AUDIO IN CH-1 switch to CAM, and the AUDIO IN CH-2 switch to LINE.

2. Press the VTR START button.

3. Check that the sound from the microphone is heard.

4. Set the AUDIO IN CH-1 switch to LINE and the AUDIO IN CH-2 switch to CAM.

5. Check that the sound from the microphone is heard.

4. Check the earphone and speaker

1. Turn the VOLUME control.
Check that the sound volume from the speaker changes.

2. Connect an earphone to the EARPHONE jack.
Check that the sound from the speaker is cut off and the sound is heard from the earphone.

3. Turn the VOLUME control.
Check that the sound volume from the earphone changes.

6. Check the external microphones

1. Connect the microphones to the AUDIO IN CH-1 and CH-2 connectors.

2. Set the AUDIO IN CH-1 and CH-2 selectors to MIC.

3. Point the external microphones to the sound source.

Set the CH SELECT switch to CH-1. Check that the level meter pointer deflects.

6. Set the CH SELECT switch to CH-2. Check that the level meter pointer deflects.

1-6-3. Audio Recording Level Adjustment

The audio recording level is automatically adjusted when the AUDIO CH-1/CH-2 MANU/AUTO switch is set to AUTO. You can also adjust the recording level manually, as follows. When the BVP-3A or BVP-30 video camera is used, the level of the audio channel 1 can be adjusted on the camera.

- Set the AUDIO IN selectors as follows:
 CAM: when using the built-in microphone
 MIC: when using an external microphone
- LINE: when using another audio equipment

 2. Set the AUDIO CH-1/CH-2 MANU/AUTO switch to
- 3. Set the METER SELECT switch to AUDIO.
- Set the CH SELECT switch as follows. CH-1: To adjust audio channel 1

MANU.

CH-2: To adjust audio channel 2

 Turn the AUDIO LEVEL CH-1 or CH-2 control so that the meter pointer swings up to 0 VU at their maximum deflection.

When a video camera BVP-3A or BVP-30 is used

The adjustment of the audio channel 1 is the same as that of the BVP-1. To adjust the audio channel 1, proceed as follows.

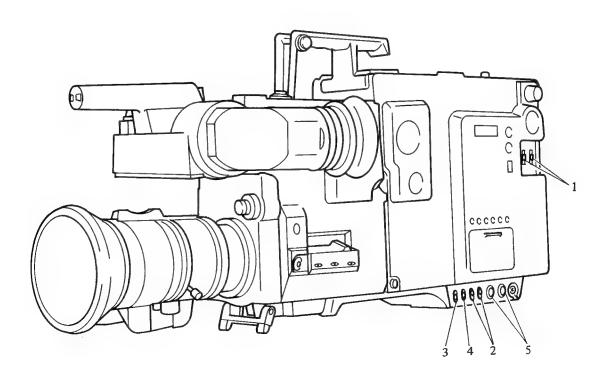
- Set the AUDIO IN CH-1 selector as follows: CAM: when using the built-in microphone MIC: when using an external microphone LINE: when using another audio equipment
- 2. Set the AUDIO CH-1 AUTO/MANU switch to MANU.
- Turn the AUDIO LEVEL CH-1 control on the VTR fully clockwise.
- 4. Set the AUDIO/FILTER switch on the camera to AUDIO.
- Turn the AUDIO CH-1 control on the camera so that the 1 through 4 lamps of the FILTER/AUDIO indicator is usually lit and the red indicator is momentarily lit at the maximum input.
 - •The maximum attenuation of the AUDIO CH-1 control on the camera is approximately 20 dB. If an appropriate level cannot be obtained within this range, adjust the level by using the AUDIO LEVEL CH-1 control on the VTR.
 - The FILTER/AUDIO indicator in the viewfinder shows the following level responding to the peak signal.

FILTER/AUDIO indicator

Level meter indication (VU)

1 2 3 4

-6 -4 0 +3+6

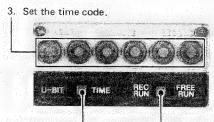


1-6-4. Alarm Sound Level Adjustment

The alarm volume from the speaker or the earphone can be adjusted with the VOLUME control. You can also modify only the alarm sound volume. For details, see the appropriate section.

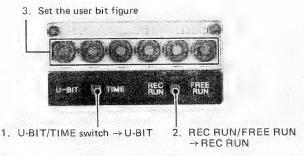
1-6-5. Setting the Time Code and User Bit

Time code



- 1. U-BIT/TIME switch \rightarrow TIME
- REC RUN/FREE RUN switch → REC RUN
- 4. If necessary, set the REC RUN/FREE RUN switch to FREE RUN.
- The maximum time code is 23:59:59. If the figure more than 23 is entered as the data of the hour, the displayed time code cannot keep the correct value.

User bit

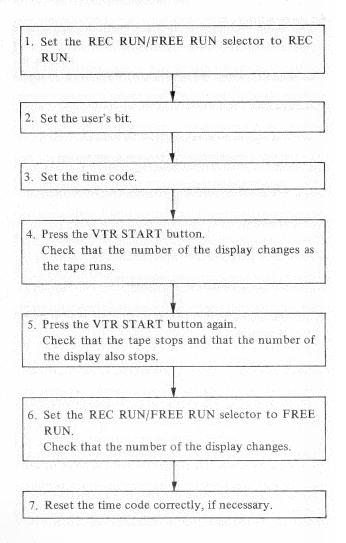


The data of the user bit is displayed in the hexadecimal notation. The figure A to F is indicated as follows in this model.

A	В	C	D	Ε	F
Display	1-1	= 1	尺	<u>-</u>	Not displayed

If you use both the time code and the user bit, set the
user bit first. If you reverse this procedure, the time
code will lose time as the time code generator stops
while the user bit is being set.

Check the time code and user bit

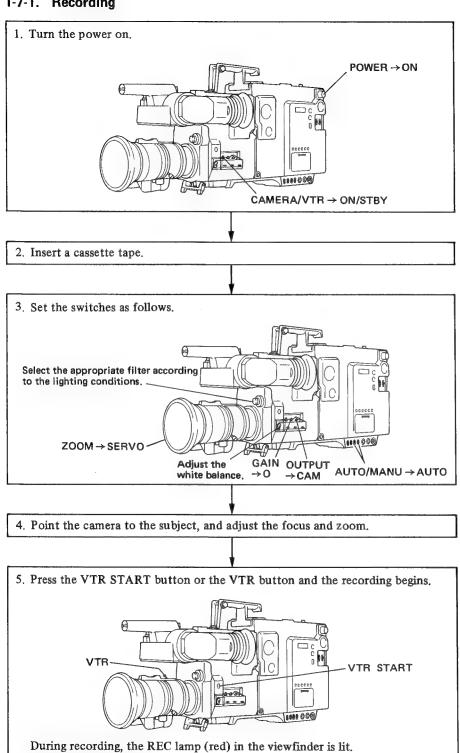


Keeping the time code during battery replacement

The back up battery hold the time code for about 1 minute while the battery is replaced.

1-7. OPERATION

1-7-1. Recording



6. To stop recording, press the VTR START button or the VTR button again. The VTR enters the pause mode and the REC lamp will go off.

1-7-2. Warning System

The indications and lamps in the viewfinder, the warning lamps on the VTR and the alarm from the speaker or the earphone serve to advise the operator of the following operational states.

	Indicati	ons in the viev	vfinder		hande han delta - Talla Talla -	Warning lam	ips on VTR		
Cause	REC	TAPE 5M	BATT	RF	SERVO	HUMID	SLACK	TAPE END	BATTERY
Tape nearly at its end	-)-	-)-						-	
End of tape	-)-							-)-	
Battery near end	->-		-)						->
Battery end	->-		-\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\						->
Something wrong in the recording system	->-								
Irregularity in servo					->-				
Moisture condensation	->-					-)-			
Slack-tape							->-		

Lamps ————	
Lamps	Sound of alarm
: Blinks in 1 Hz	W : In 1 kHz, 1 second interval
: Blinks in 4 Hz	₩ ₩ : In 1 kHz, 1/4 second interval
- : Lights up	₩₩ : Continuous sound

Alarm sound	VTR operation and correction
W W	Recording continues.
MWW	Recording stops. Change cassettes.
W W	Recording continues.
N WW	Recording stops. Change batteries.
W W W	Recording continues. Recording may not be performed correctly. Head-cleaning is required.
W W W	Recording continued. Recording may not be performed correctly. Turn off the power and consult your nearest Sony dealer. The lamp may momentarily blinks when the tape starts running, but this is not a problem.
W W W	Recording continues as long as the tape does not stick to the head drum. If this happens, recording will stop and the tape will be unloaded.
N WW	Recording stops. The POWER switch and the EJECT button do not function. Remove the cassette manually referring to the appropriate section.

Notice on moisture condensation

Moisture may condense on the drum assembly if the set is moved directly from a cold to a warm location or if the set is used in a very humid place. This may cause resulting in damage to the tape to adhered the head drum. To avoid this, take care on the following precautions.

- When the set is moved directly from a cold to a warm location, be sure to remove the cassette.
- Before inserting a cassette, set the POWER switch to ON and check that the HUMID lamp does not light. If it lights, wait until the HUMID lamp goes off before inserting a cassette.

• If moisture has been condensed in the VTR with the cassette inserted proceed as follows:

If the POWER switch is set to OFF

Press the EJECT button and remove the cassette. Set the POWER switch to ON and wait until the HUMID lamp goes off.

If the POWER switch is set to ON and the VTR is in the record or standby mode

Press the EJECT button and remove the cassette. Wait until the HUMID lamp goes off.

1-8. DROP FRAME AND NON-DROP FRAME

The BVV-1 operates in the drop frame mode. To change the set to the non-drop frame mode, refer to the appropriate section.

1-9. CLEANING THE HEADS

Use the HG-5CL cleaning cassette to clean the heads. Carefully read the instruction manual furnished with the HG-5CL. Excessive or incorrect use of the cleaning cassette may shorten the head life.

1-10. NOTES ON OPERATION

Do not use the unit in extremely hot or cold locations or in places where the humidity is high. The unit is designed to operate in temperatures ranging from 0°C to 40°C (32°F to 104°F). Avoid sudden temperature changes, particularly from an extremely cold location to a warm one, as this is conductive to condensation of moisture on the head drum assembly.

- Do not subject the unit to unnecessary vibration when carrying it.
- · Avoid dusty locations.
- If the unit is not used for an extended period of time, remove the battery pack.

1-11. SPECIFICATIONS

Mechanical section

Weight BVV-1: 3.4 kg (7 lb 8 oz)

NP-1 battery pack: 680 g (1 lb 8 oz)

IIC 00 of the second state of the control of

HG-20 video cassette tape: 200 g (7 oz) Dimensions 112 x 203 x 232 mm (w/h/d)

 $(4 \ 1/2 \times 8 \times 9 \ 1/4 \text{ inches})$

Video cassette

HG-20 cassette (1/2-inch cassette for Beta for-

mat) and equivalent

Tape speed 118.6 mm/sec

Wow and flutter

Less than 0.15% rms (with standard playback

machine)

Continuous recording time

Approx. 50 minutes with fully charged NP-1

battery pack when the BVP-1 is used together

Recording time

20 minutes (with HG-20)

Connectors Camera: 50 pin

AUDIO IN CH-1/CH-2: XLR 3 pin, female

EARPHONE: mini jack DC IN 12 V: XLR 4 pin

Operating temperature

0°C to 40°C (32°F to 104°F)

Operating humidity

less than 80% (relative humidity)

Storage temperature

-20 °C to +60 °C (-4 °F to +140 °F)

Electrical section

Power requirements

DC 12 $V_{-0.5}^{+2} V$

Using the NP-1 battery pack (nickel-cadmium,

1.5 Ah)

For ac operation: use AC-500 ac power adap-

tor (optional)

Power consumption

10W (12V, 830 mA)

2.4 W in power save mode

Video

Recording system

Luminance: FM

Chrominance: Compressed Time Division

Multiplex FM

Input Luminance: 1.0 V(p-p), 1 k ohm, unbalanced

Chrominance: R-Y 0.7 V(p-p), 1 k ohm un-

balanced

B-Y 0.7V(p-p), 1k ohm un-

balanced

Sync: 5 V(p-p) (TTL level)

Bandwidth Luminance: $30 \text{ Hz} - 4.1 \text{ MHz}_{-6.0}^{+0.5} \text{ dB}$

Chrominance: R-Y 30 Hz - 1.5 MHz $^{+0.5}_{-3.0}$ dB

 $B-Y = 30 Hz - 1.5 MHz_{-3.0}^{+0.5} dB$

Signal-to-noise ratio

Luminance: More than 48 dB

AM: More than 50 dB

PM: More than 50 dB

K factor (2T pulse)

Less than 3%

Y/C delay Less than 20 nsec

Audio

Input MIC: -60 dB, 3 k ohms, balanced

(for 600 ohm microphones)

LINE: +4 dB, 10 k ohms, balanced

Output Speaker, EARPHONE (for 8 ohm earphone):

-20 dB Max (variable)

Frequency response

 $50\,Hz$ to $15\,kHz$ $\pm 3\,dB$ (with standard play-

back machine)

Distortion Less than 2% (with 1 kHz reference level,

standard playback machine)

Signal-to-noise ratio

Better than 50 dB (3% distortion, with stand-

ard playback machine)

Supplied accessories

Shoulder strap x1

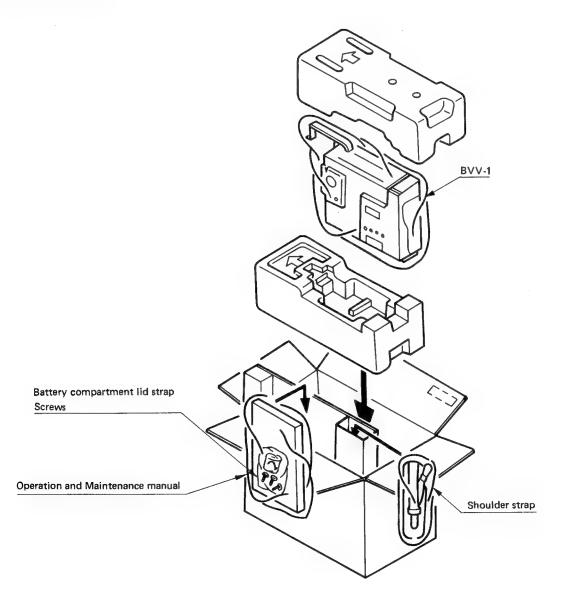
Battery compartment lid strap x1

Screws x3 50 pin cap x 1

Recommended equipment

Color video camera BVP-1, BVP-3, BVP-3A, BVP-30
Battery pack NP-1
Battery charger BC-1W
Ac power adaptor AC-500
Earphone ME-20B
Battery adaptor DC-100
Wireless microphone WRT-57
UHF portable tuner WRR-27
UHF transmitter WRT-27
WRR adaptor BTA-27
Cassette tape HG-20
Betacam VTR BVW-10, BVW-20, BVW-40
Composite adaptor (14 pin) VA-1V
Component adaptor (26 pin) VA-1

1-12. PACKING



SECTION 2 TECHNICAL INFORMATION

2-1. SPECIFICATIONS 2-1-1. Specifications

G	P	N	r	D	A	T
u	ю	м	г.	n.	А	. 1.

MECHANICAL

Weight BVV-1 3.4kg

Battery Pack, NP-1 680g Video cassette tape, HG-20 200g

Dimensions 112 x 203 x 232mm

(4-2/1 x 8 x 9-1/4 inches)

(w/h/d)

Video cassettes HG-20 cassette (1/2-inch cassette for Beta format)

and equivalent

Tape speed 118.6mm/s

Wow/flutter Less than 0.15% rms (with standard playback machine)

Continuous recording time About 50 minutes with fully charged NP-1 battery pack

Recording time 20 minutes (with HG-20 cassette tape)

Operating temperature 0°C to +40°C (32°F to 104°F)
Operating humidity Less than 80% (relative humidity)
Strage temperature -20°C to +60°C (-4°F to +140°F)

Operating position Horizontal or vertical

CONNECTOR

CAMERA 50-pin connector

AUDIO IN CH-1/CH-2 XLR female connector

EARPHONE Minijack

ELECTRICAL

Power requirement DC12V + 2.0, -0.5

Using NP-1 battery pack (Ni-Cd, 1.5Ah)

AC power can also be supplied
Using AC-500, ac adaptor (optional)

Power consumption 10W (12V 830mA)

2.4W in power save mode

VIDEO

Video recording system Y FM

C Compressed time division multiplexed: FM

Input Y 1.0 Vp-p 1kohms unbalanced

R-Y 0.7Vp-p 1kohms unbalanced
B-Y 0.7Vp-p 1kohms unbalanced

SYNC 5Vp-p (TTL level)

Band width Y 30Hz to 4.1MHz +0.5dB, -6.0dB

C (R-Y) 30Hz to 1.5MHz +0.5dB, -3.0dB

(B-Y) 30Hz to 1.5MHz +0.5dB, -3.0dB

Signal-to-noise ratio Y More than 48dB

> More than 50dB AM

PMMore than 50dB

Less than 3% K factor (2T pulse)

Less than 20nsec Y/C delay

AUDIO

-60dB, 3kohms, balanced (matches 600-ohm microphones) Input MIC

> +4dB, 10kohms, balanced LINE

Speaker, earphone Matches 8-ohm earphone Output

Maximum output -20dB max. (variable)

50Hz to 15kHz + 3dB (with standard playback machine) Frequency response

Less than 2% (with 1kHz reference level, standard Distorsion

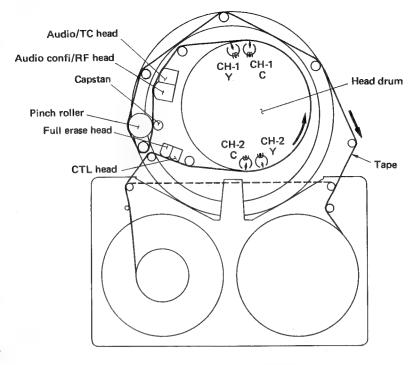
playback machine)

Better than 50dB (3% distorsion, with standard Signal-to-noise ratio

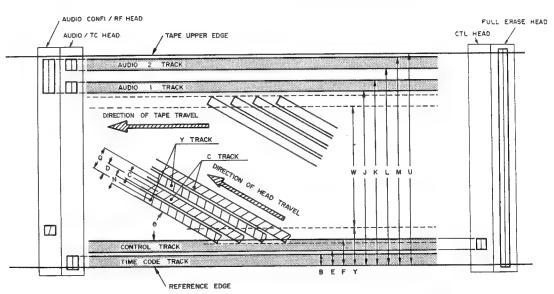
playback machine)

2-1-2. Tape Format

TAPE TRANSPORT



TAPE PATTERN



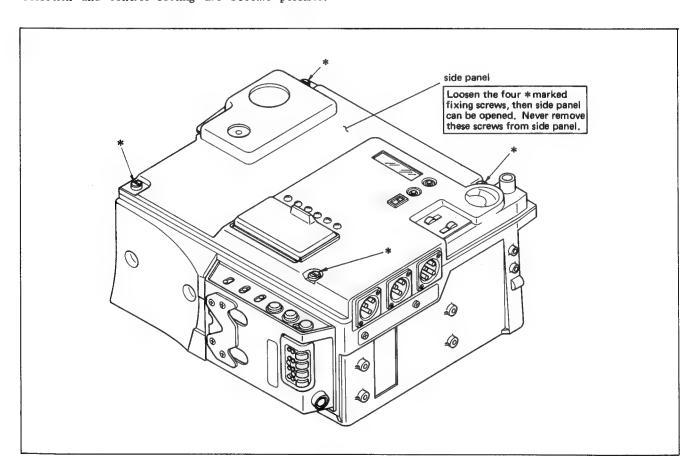
					Unit: mm
B :	Time Code Track Upper Edge	0.4	L :	Audio 2 Track Lower Edge	11.85
C :	C Track Width	0.073	M :	Audio 2 Track Upper Edge	12.45
D:	Y-C Track Pitch	0.0805	N :	Y Track Width	0.073
	Control Track Lower Edge	0.7	Q :	Video Track Pitch	0.161
	Control Track Upper Edge	1.1	U :	Tape Width	12.7
	Audio 1 Track Lower Edge	10.85	\mathbf{W} :	Video Area Effective Width	9.384
	Audio 1 Track Upper Edge	11.45	Y :	Lower Limit of W	1.248
			Θ:	Track Angle	4.679°

2-2. SETTING OF SYSTEM SELECT CIRCUIT AND ADJUSTMENT OF WARNING SOUND LEVEL

Along with the select switches and controls that are located on the side panel, the internal system select circuit and warning sound control are located on the circuit boards. The function of these internal circuit and control on the circuit board are described. These internal circuit and control must be used according to systems and conditions.

(1) Opening of Side Panel

Open the side panel. Then the following system selection and control setting are become possible.



(2) Selection of Drop-frame or Non-drop-frame (TC board : J1)

Select either drop-frame display or non-drop-frame display for the TAPE TIMER or TIME CODE DISPLAY. For drop-frame display: Open

For non-drop-frame display : Short

When the set is shipped, it is set to the drop-frame display.

(3) Level Control of Warning Sound (VA board: RV703) The output level of both the audio and warning sound from speaker or earphone can be controlled at the same time by the LEVEL CONTROL knob on the side panel. But only the warning sound level can be controlled independently. This level control is performed by RV703 on VA board. When the set is shipped, it is set to the maximum output level.

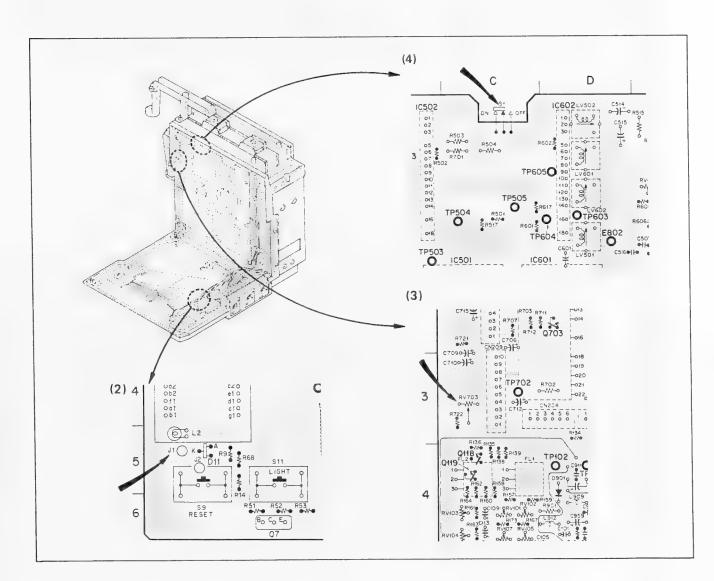
(4) Audio Noise Reduction ON/OFF Switch (VA board : S1)

Select for audio noise reduction on or off.

Noise reduction ON: ON

Noise reduction OFF: OFF

When the set is shipped, it is set to the noise reduction OFF state.



2-3. INPUT/OUTPUT SIGNAL OF THE CONNECTOR

Input and output signals of the connector are as follows:

AUDIO IN (CH-1/L, CH-2/R)

MIC IN

: -60dB 3kohms balanced (matches 600-ohm microphone)

LINE IN

: +4dB 10kohms

DC IN

DC IN

: +12V, more than 3A (1pin:GND, 2pin:NC, 3pin:NC, 4pin:+12V)

EXT.BATTERY : +12V (1pin:+12V, 2pin:+12V, 3pin:GND, 4pin:GND, 5pin:NC)

IN

(When battery pack output voltage decrease to 11.45Vdc, the warning sound and the lamp in viewfinder tell that the battery is reaching its usable end. When voltage becomes 11.0 V, warning sound and viewfinder lamp tell that the battery has

reached its end while VTR stops its operation.)

CAMERA 50P

Pin	VO 51 - 1		Sį	pecifications
No.	I/O Signal	Camera Side	Direction	VTR Side
1				
2				
3				
4				
5	GND (Power)			
6	GND (Power)			
7				
8				
9				
10				
11				
12				
13				
14				
15	MIC (G)			
16	MIC (X)	Low impedance (lower than 600 ohms) balanced, -60 dBm	00	Input impedance: 3 k ohms ~ 10 k ohms balanced (recorded on CH-2)
17	MIC (Y)			
18				
19				

D'a			pecifications	
Pin No.	I/O Signal	Camera Side	Direction	VTR Side
20	Audio CH-l Indicate	$Z_i \ge 1 K\Omega$		Zo:Low impedance Level:-15dBs±1 at REF level
21				
22	TAPE IND. 1 (10M)	Imax = 10 mA		H = 4.5 V $\stackrel{\pm 0.5}{=}$ (camera side open) L = 0 V $\stackrel{\pm 0.5}{=}$ Output impedance: 330 ohms \pm 5%
23	TAPE IND. 2 (5M)	Imax = 10 mA		H = 4.5 $V_{-0.5}^{\pm 0.5}$ (camera side open) L = 0 $V_{-0.5}^{+0.5}$ Output impedance: 330 ohms ± 5%
24	REC/TALLY	Input impedance: 20 k ohms		5.0 $V_{-0.5}^{+1.0}$ 2.5 $V_{-0.3}^{\pm0.5}$ Warning sound REC VTR connected A/B: 50 \pm 10% duty frequency 1 \pm 0.2 Hz or 4 \pm 0.8 Hz
25	BATT IND	Input impedance: 300 ohms RED LED		2~3 V A B 300Ω before end** under cut** 14.5 Vmax open, 2 ~ 3 V with 300 ohms load A/B: 50 + 10% duty frequency 1 ± 0.2 Hz or 4 ± 0.8 Hz ** Before end: 11.45 V Under cut: 11.0 V
26				
27	VTR START/STOP	$5 V^{\pm 1.0}$ Output impedance: less than $10 k$ ohms START: $5 V^{\pm 1.0}_{-0.1}$ STOP: $0 V^{+0.2}_{-0.1}$		START: 5 V +3.0 STOP: 0 V -0.5
28	3			
25	R-Y VIDEO (X)	0.7 Vp-p (75% color bars) Output impedance: 75 ohms ± 5%		Input impedance: 1 k ohms ± 5%
31	R-Y VIDEO (G)	DC: 0 ± 200 mV		
3	Audio CH-1 Level Contrel	DC 0V ~ more than 7V		$Zi \ge 100 \text{K} \Omega$ $DC \qquad \qquad CH-1$ $GAIN$ $OV \text{ or open} \qquad Ref \text{ level}$ $7V \qquad \qquad \text{less than } -20 \text{dB}$

Pin	I/O SiI	Specifications					
No.	I/O Signal	Camera Side	Direction	VTR Side			
32	VTR SAVE	4.5 V ± 0.5 V (STANDBY: 0 V or open) Output impedance: less than 10 k ohms		Input impedance: more than 100 k ohms (VTR should be in SAVE mode when camera is in PREHEAT.)			
33	AUDIO MONITOR	750Ω/1 kHz		Low impedance Level: -6 dBs			
34	SYNC("L")	$V_{OH} = 5 \text{ V}_{-1.0}^{+0.2}, \ I_{OH} = 1 \text{ mAmax}$ $V_{OL} = 0.8 \text{ Vmax}, \ I_{OL} = -1.5 \text{ mAmax}$		·			
35							
36	REW CONTROL	Input impedance: 100 k ohms ± 5%	-	REW: 4.5 V ± 0.5 V NORMAL: 0 V ± 0.5 V Output impedance: 10 k ohms ± 5%			
37							
38							
39	+12V (Power)						
40	+12V (Power)		-	10.6 V min (at 3 A), 14.5 V max			
41	LUMINANCE (X)	1.0 Vp-p DC: 0 ± 200 mV	0 0-				
42	LUMINANCE (G)	Output impedance: 75 ohms ± 5%		Input impedance: 1 k ohm ± 5%			
43							
44							
45							
46		Walking Walking					
47							
48							
49	B-Y VIDEO (X)	0.7 Vp-p Output impedance: 75 ohms ± 5%	0.0				
50	B-Y VIDEO (G)	DC: 0 ± 200 mV (75% color bars)		Input impedance: 1 k ohm ± 5%			

2-4. CONNECTORS FOR OPTIONAL CONNECTION

When external cables are connected to the connectors on the set during the maintenance, hardwares as stated below or the equivalents must be used.

AUDIO IN 1-508-084-00

CONNECTOR, 3P, MALE

DC IN 1-508-362-00

PLUG, XLR, 4P, FEMALE

EXT.BATTERY IN 1-560-976-00

PLUG, 5P

CAMERA 1-562-112-21

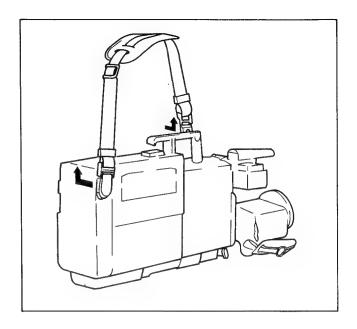
CONNECTOR, 50P, MALE

2-5. SUPPLIED ACCESSORY

Supplied BVV-1 accessories are as follows:

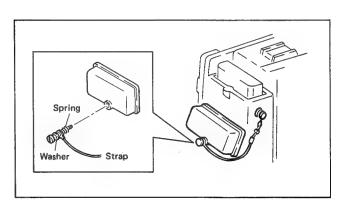
(1) Shoulder Strap

The shouler strap can be attached to the BVV-1 and the machine carried on the operator's shoulder. Both ends of the strap are attached to the knob of the machine with one operation.



(2) Battery Cover Strap

The battery cover strap is used to prevent losing the battery cover. Installing procedure is shown in figure.



(3) 50P connector Cap

The 50P connector cap is used for preventing dust or rain from going into 50P connector when the BVV-1 is carried as the single unit or kept in the broadcast station as the single unit.

(4) Screw

These screws are used for installing the VTR into camera.

2-6. OPTIONAL ACCESSORY

The followings are provided as the optional accessory. The suitable accessory can be used for each system.

(1) Color Video Camera: BVP-30

BVP-30 employs 2/3 inch "PLUMBICON in three pick -up tubes. The BETACAM system is composed by BVV-1 and BVP-30.

(2) Color Video Camera: BVP-3A

BVP-3A employs 2/3 inch "SATICON" in three pick -up tubes. The BETACAM system is composed by BVV-1 and BVP-3A.

- (3) Battery Pack: NP-1
- (4) Battery Charger :BC-1WA

The BC-1WA battery charger is designed to charge NP-1 battery packs.

Four NP-1 battery packs can be inserted at one time, and will be charged in sequence automatically. Charging time of a bettery pack can be as far as 1 hour.

(5) AC Adaptor: AC-500

The BVV-1 can be driven by an AC power source by connecting the AC adaptor, AC-500. This AC-500 is worldwide type of adaptor. AC-500 can be used with 100/120/220/240V commercial power supplies just by setting the voltage selector to the appropriate position for a stable supply of DC power.

(6) Earphone: ME-20B

The audio simultaneous playback sound (mixed sound of CH-1 and CH-2) in the REC mode can be monitored by connecting this ME-20B with EARPHONE jack of BVV-1. In other modes (except REC mode), the selected EE sound (selected by AUDIO IN and CH SELECT) can be monitored.

(7) Battery Case: DC-100

The long time operation can be performed by adding an optional battery pack, NP-1, to the internal battery pack. The battery case, DC-100 is a case of an optional battery pack. This DC-100 can be attached to the VTR easily.

(8) Wireless Microphone System

UHF portable tuner : WRR-27

Transmitter

: WRT-27

Wireless microphone: WRT-57

The audio sound can be recorded on the tape without wire cable by using these wireless microphone system.

- (9) VTR Component Adaptor: VA-1
- (10) VTR Composite Adaptor: VA-1V

2-7. USE UNDER SPECIAL ENVIRONMENT (MEASURE FOR COLD AREA)

The BVV-1's quality guaranteed temperatures are from 5° C to 35° C while its operation guaranteed temperatures are from 0° C to 40° C.

When the equipment should be used outside the aforementioned temperature range, especially when used below these temperature, cover-cloth for cold temperature is recommended.

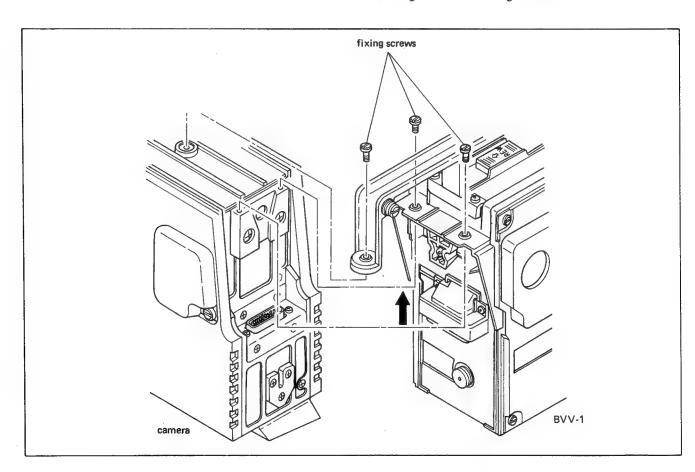
2-8. VTR AND CAMERA BLOCKS REMOVAL AND INSTALLING PROCEDURES

Disassembly and assembly procedures of the camera block and VTR block are follows:

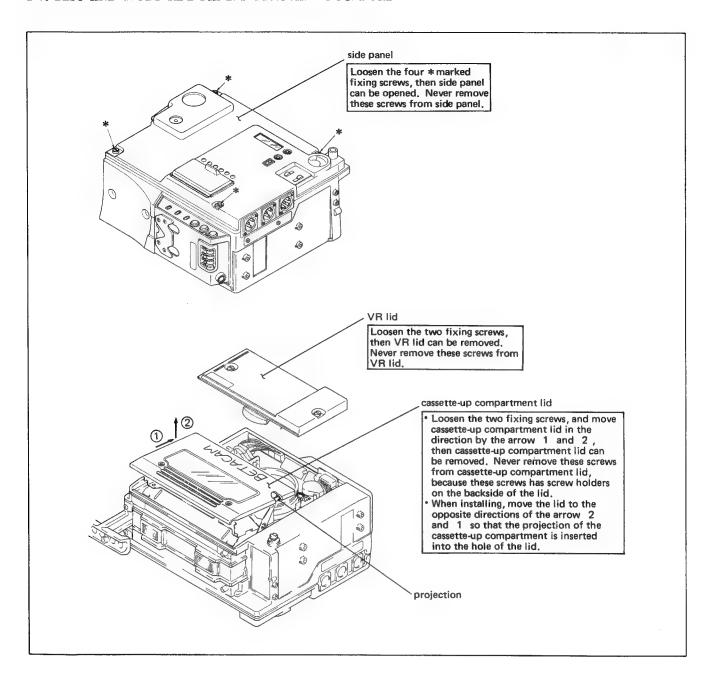
- (1) Disassembly procedures
- (i) Remove three fixing screws as shown in figure.
- (ii) Disassembly the VTR by moving in the direction shown by arrow.

(2) Assembly procedures

- (i) Assemble the VTR and camera by moving in the opposite directins shown by arrow.
 - . If the VTR's 50P connector cannot be inserted into the camera's connector, slightly move the the VTR's connector by hand.
- (ii) Tighten three fixing screws.

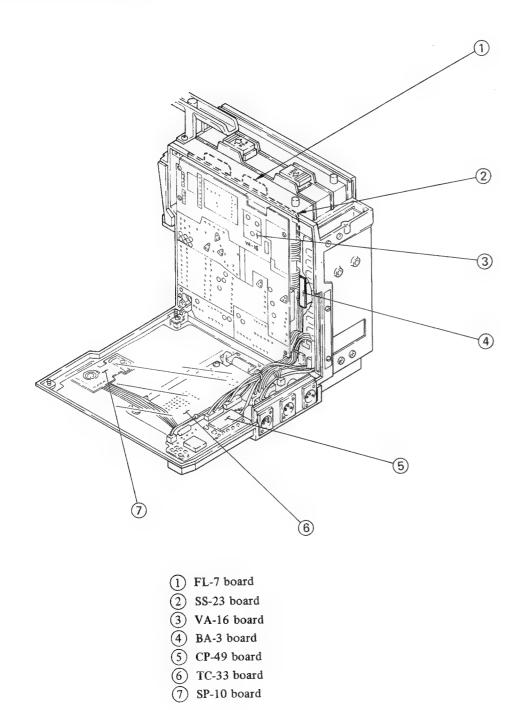


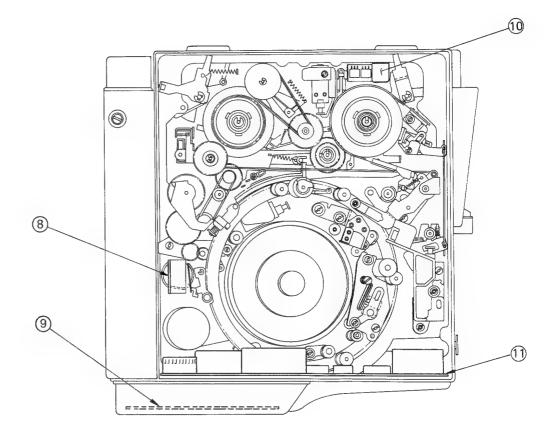
2-9. LEFT AND RIGHT SIDE PANELS REMOVAL PROCEDURE



2-10. LOCATION OF MAIN PARTS

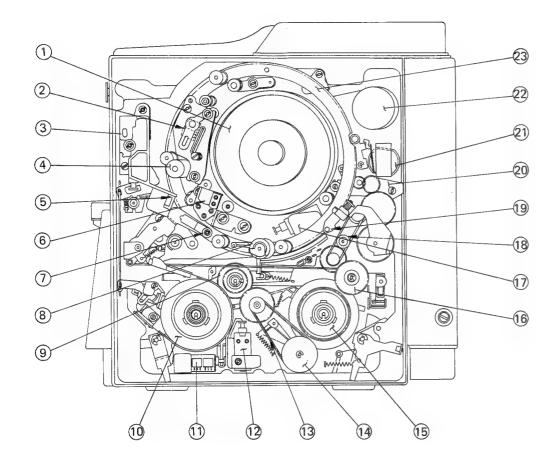
2-10-1. Location of the Printed Circuit Boards





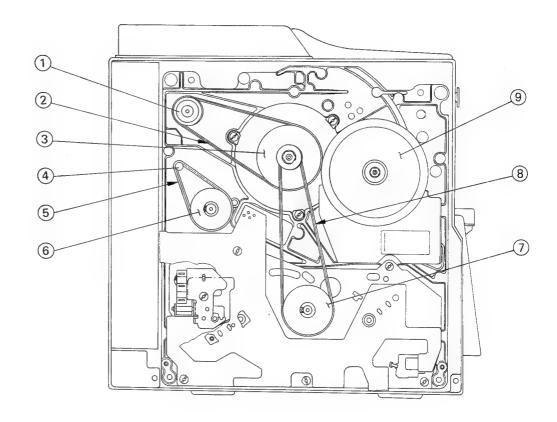
- 8 SW-82 board
 9 LC-6 board
 10 FL-7 board
 TR-15 board

2-10-2. Location of the Mechanical Main Parts/Components



- 1 Head Drum
- (2) Audio/Audio Confi./Video Confi./TC Heads
- 3 Pinch Solenoid
- 4 Capstan
- 5 Tape End Sensor
- 6 CTL/Full Erase Heads
- 7 Tension Regulator Arm
- 8 Pinch Roller
- 9 REW Pulley
- (10) Supply Reel Table
- 11) Brake Solenoid
- (12) Idler Solenoid

- 13 FWD Belt
- (14) FWD Pulley
- 15) Take-up Reel Table
- 16 EJECT Pulley
- (17) EJECT Solenoid
- (18) EJECT Belt
- (19) Slant Guide
- 20) Gear Block 21) Threading Motor
- 22) Drum Motor
- 23 Threading Ring



- 1 D Motor Pulley
- 2 Drum Belt
- 3 Drum Pulley
- 4 Threading Motor Pulley
- (5) Threading Motor Belt
- 6 Deceleration Pulley
- 7) Midway Pulley
- 8 Mechanical Belt
- (9) Capstan Motor

2-11. PRINTED CIRCUIT BOARDS

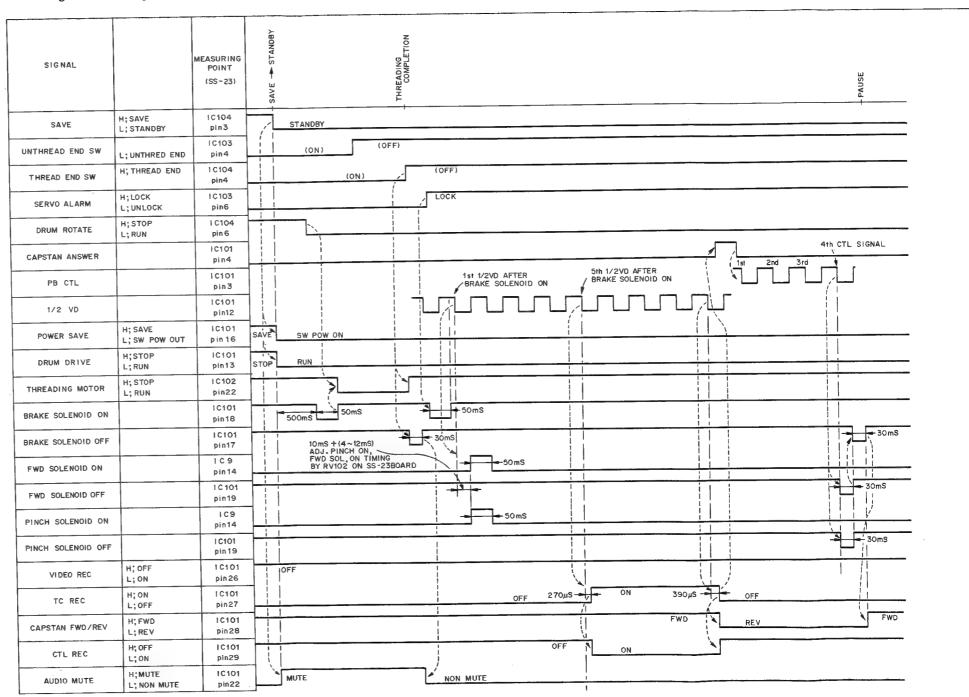
The circuit information is proveded below.

Board	Circuit function
VA-16	
/RA-8, AL-6\	Video recording system
TG-5, PG-3	Audio recording system
\DU-18	
SS-23	Servo system
	System control system
	CTL record amplifier
	Time code record amplifier
	Humid sensor
TR-15	Pinch solenoid driver
	Threading motor driver
	Drum motor driver
LC-6	Audio line amplifier
	Audio level control
TC-33	Time code generator
SP-10	Speaker amplifier
CP-49	Connector panel
DUS-34	
SW-82	Unthread end detector
BA-3	Time code back-up battery
FL-7	Flexible harness board

2-12. TIMING CHART OF MAIN FUNCTION

THREADING \rightarrow PAUSE OPERATION IN STANDBY MODE

(The 1st time threading \rightarrow PAUSE operation)

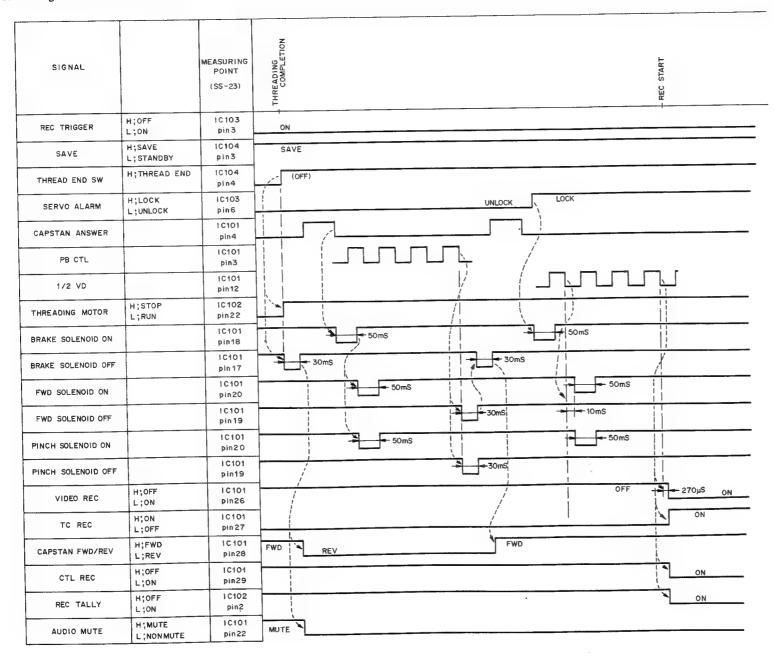


THREADING \rightarrow PAUSE OPERATION IN STANDBY MODE (The 2nd or several times threading \rightarrow PAUSE operation)

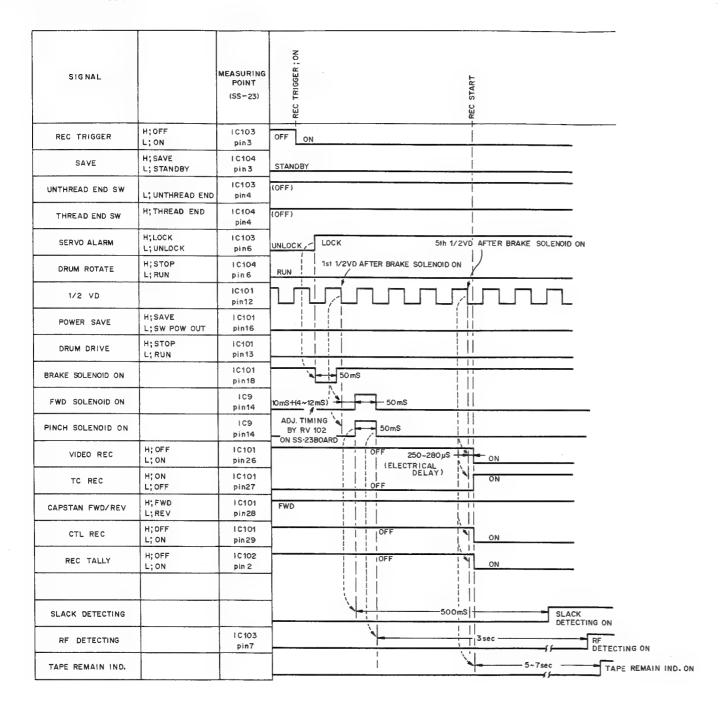
SIGNAL		MEASURING POINT (SS-23)	SAVE - STANDBY COMBLETION
SAVE	H;SAVE L;STANDBY	IC104 pin3	SAVE STANDBY
UNTHREAD END SW	L;UNTHREAD END	1C103 pin4	(OFF)
THREAD END SW	H;THREAD END	IC104 pin4	(OFF)
DRUM ROTATE	H;STOP L;RUN	1 C104 pin6	
CAPSTAN ANSWER		1C101 pin4	
PB CTL		1C101 pin3	
POWER SAVE	H; SAVE L; SW POW OUT	IC 101 pin16	SAVE
DRUM DRIVE	H;STOP L;RUN	IC101 pin13	STOP
THREADING MOTOR	H;STOP L;RUN	IC102 pin22	RUN
BRAKE SOLENOID ON		IC101 pin18	500mS 50mS -50mS
BRAKE SOLENOID OFF		IC101 pin17	30ms 30ms
FWD SOLENOID ON		1 C101 pin 20	50mS
FWD SOLENOID OFF		1C101 pin19	30mS
PINCH SOLENOID ON		IC101 pin 20	50mS
PINCH SOLENOID OFF		1 C 1 O 1 pin 1 9	30mS
CAPSTAN FWD/REV	H;FWD L;REV	1 C 101 pin 28	FWD REV FWD
AUDIO MUTE	H; MUTE	1C101 pin22	

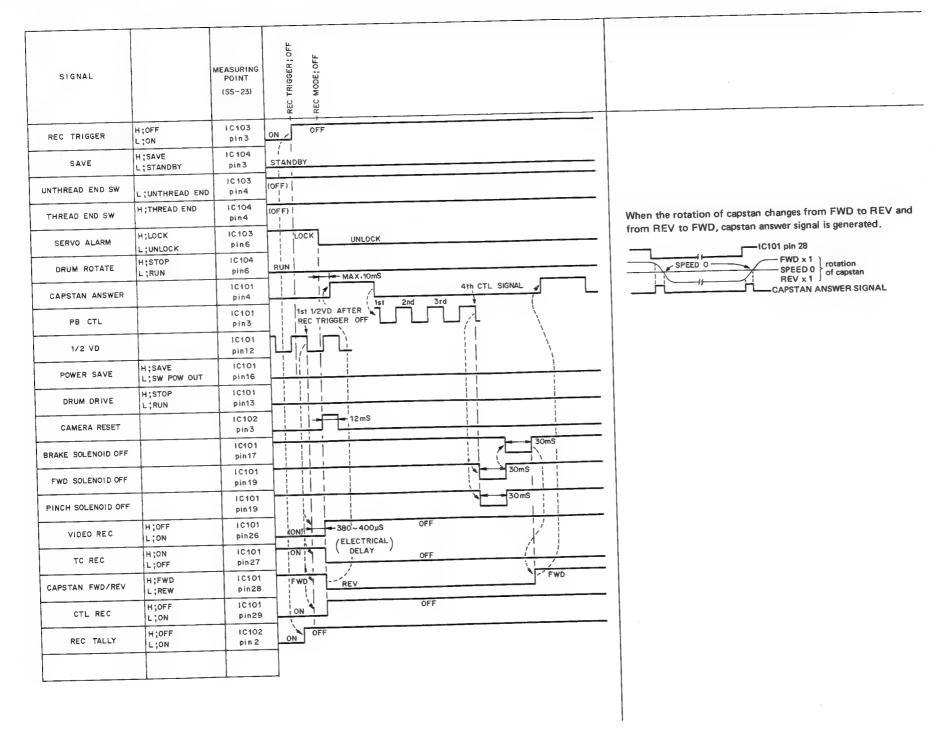
THREADING \rightarrow REC OPERATION IN STANDBY MODE

(. SAVE mode in several times \rightarrow Threading mode \rightarrow REC mode
(. Unthreading mode \rightarrow Threading mode \rightarrow REC mode

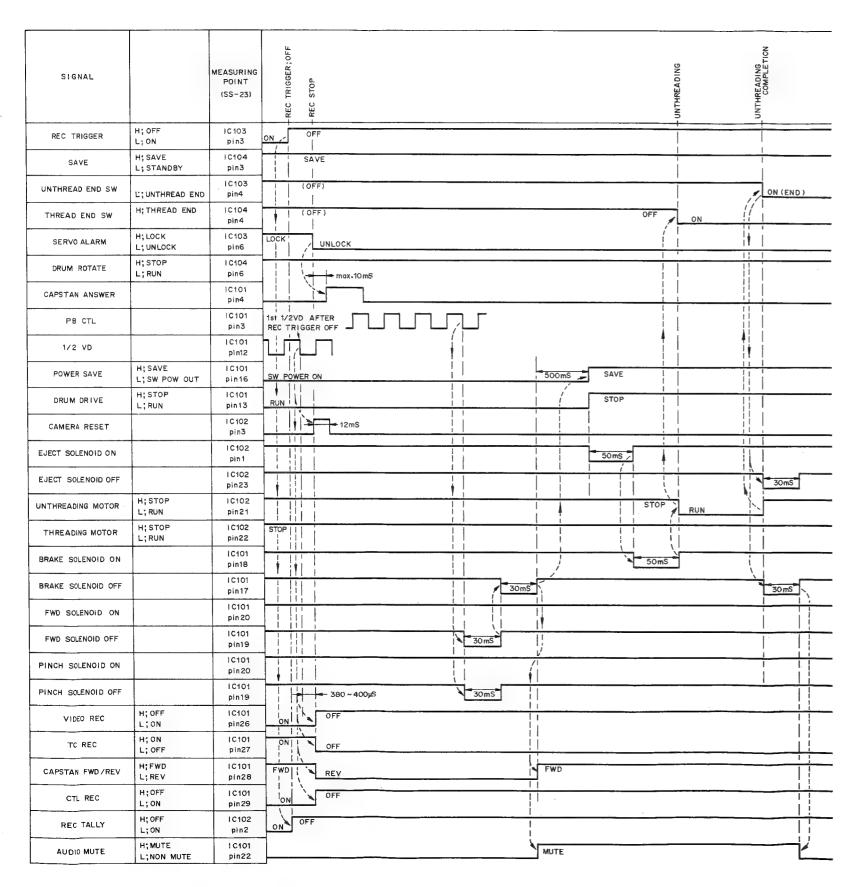


REC ON OPERATION IN STANDBY MODE





REC OFF OPERATION IN SAVE MODE

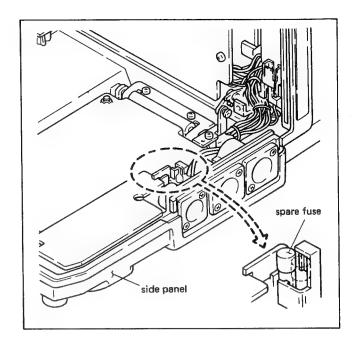


REW OPERATION

SIGNAL		MEASURING POINT (SS-23)	REW MODE ON	REW MODE OFF
REC TRIGGER	H; OFF L; ON	IC103 pin3	OFF	
SAVE	H; SAVE L; STANDBY	IC104 pin3	SAVE	
UNTHERD END SW	L; THREAD END	IC103 pin4	ON	
THREAD END SW	H; THREAD END	IC104 pin4	ON	
REW SW	H; OFF L; ON	IC104 pin2	OFF	ON OFF ON
POWER SAVE	H; SAVE L; SW POW OUT	1C1O1 pin16	SAVE	SW POW OUT
DRUM DRIVE	H;STOP L;RUN	IC101 pin 13	STOP	RUN STOP RUN
CAMERA RESET		IC102 pin3		30mS
BRAKE SOLENOID ON		1C101 pin18		470mS 50mS 470mS 50mS
BRAKE SOLENOID OFF		1C101 pin 17		30ms
CAPSTAN FWD/REV	H; FWD L; REV	1C101 pin28		
REW MODE	H; ON L; OFF	IC101 pin15	OFF	ON OFF ON
AUDIO MUTE	H; MUTE L; NON MUTE	I C101 pin 22		MUTE

2-13. SPARE FUSE

The spare fuse of the fuse (ref.No. F1) mounted on CP-49 board is installed into the side panel as shown in figure. When necessary, replace the fuse with this spare fuse.



SECTION 3 PERIODIC CHECK AND MAINTENANCE

3-1. PERIODIC CHECK

Before starting to the news gathering, it is recommended to check the system to operate normally by performing the following checks.

The periodic check for the camera block, refer to the "Operation and Maintenance Manual" of CAMERA. The check procedure described here is in the VTR connected with CAMERA but can be applied on the operation with other cameras.

3-1-1. START, STOP, REW, EJECT, Functions Check

Equipment

: Fully charged battery

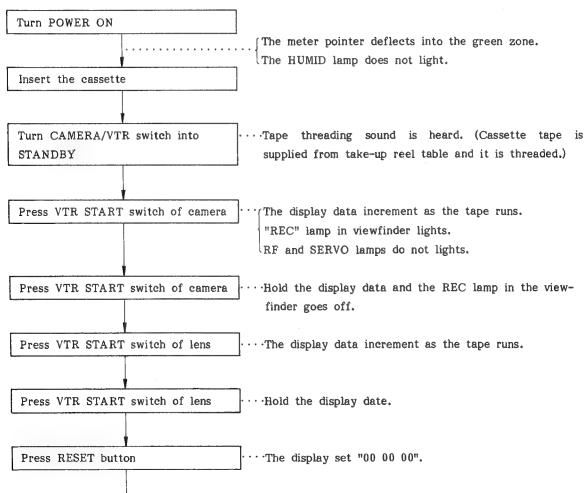
With switches set to

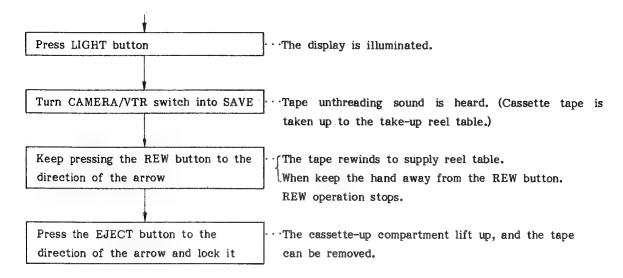
: POWER → ON

TAPE TIMER/TIME CODE → TAPE TIMER

CAMERA/VTR → SAVE METER SELECT → BATT

ACTION





3-1-2. AUTO/MANUAL Function Check of the Audio Recording Level

Equipment : Fully charged battery

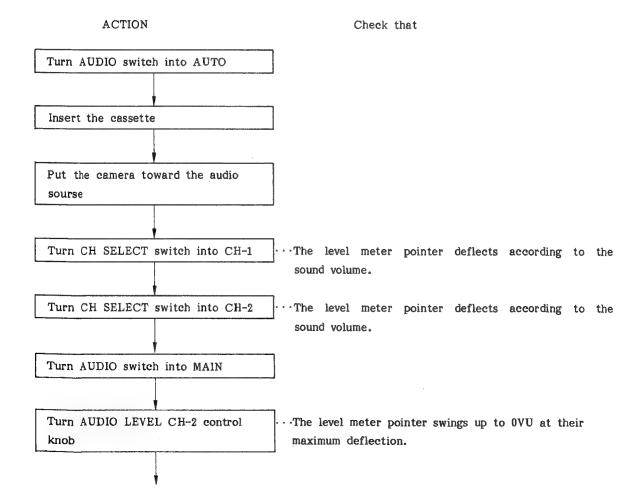
Cassette tape, HG-20

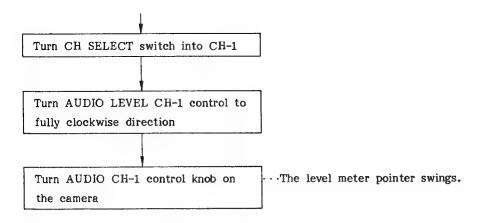
With switches set to : POWER → ON

METER SELECT → AUDIO

CAMERA/VTR → VTR STBY

AUDIO IN CH-1/CH-2 → CAM





3-1-3. The External Microphone Connection Check

Equipment

: Fully charged battery

Microphone (600 ohms)

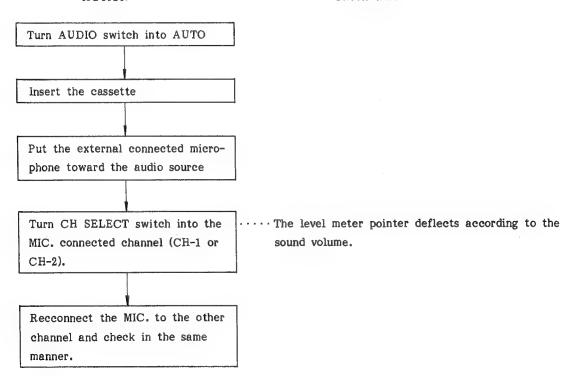
Cassette tape

With switches set to

: POWER → ON

METER SELECT \rightarrow AUDIO CAMERA/VTR \rightarrow VTR STBY AUDIO IN CH-1/CH-2 \rightarrow MIC

ACTION



3-1-4. Audio Simultaneous Playback Function/Audio Level Check

Equipment

: Fully charged battery

Cassette tape, HG-20

Earphone

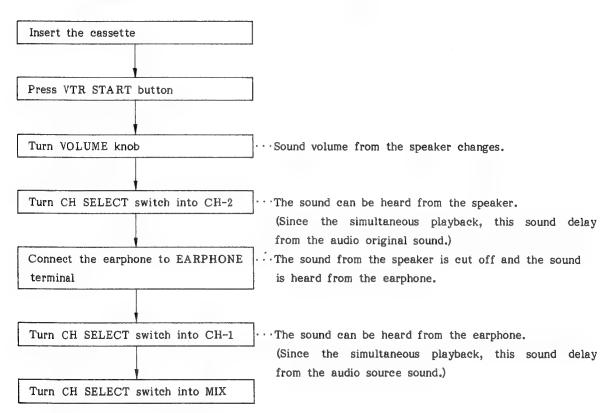
With switches set to

: POWER → ON

AUDIO IN CH-1/CH-2 → CAM

CAMERA/VTR \rightarrow STBY AUDIO SW \rightarrow AUTO

ACTION



3-1-5. Time Code Function Check

Equipment

: Fully charged battery

Cassette tape, HG-20

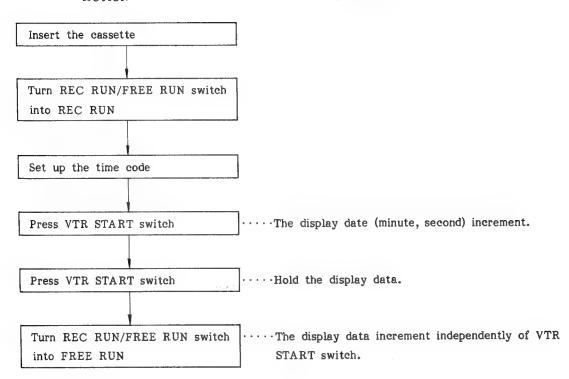
With switches set to

: POWER → ON

TAPE TIMER/TIME CODE → TIME CODE

 $\begin{array}{l} {\rm CAMERA/VTR} \ \rightarrow \ {\rm STBY} \\ {\rm U-BIT/TIME} \ \rightarrow \ {\rm TIME} \end{array}$

ACTION



3-1-6. Record Function Check

In this section, check the recorded tape with VTR is normally recorded or not.

The function of the camera conneted with VTR should be checked already. (Refer to Operation and Maintenance Manual of camera.)

Equipment

: Fully charged battery

Cassette tape, HG-20

BETACAM system playback machine (The playback function of VTR should be checked before this function check according to the check procedures of Operation and Maintenance Manual)

Video and audio monitor

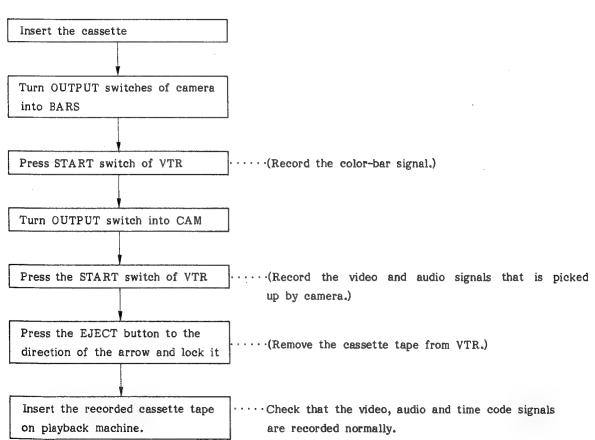
With switches set to

POWER → ON

AUDIO → AUTO

CAMERA/VTR → VTR STBY AUDIO IN CH-1/CH-2 → CAM

ACTION

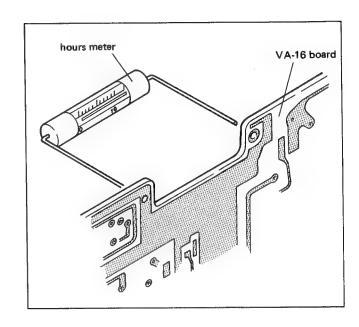


3-2. MAINTENANCE

It is recommended that the following periodic check and maintenance schedule be employed in order to obtain maximum performance and longer tape life from the BVV-1.

3-2-1. Hours Meter

The BVV-1 has an hours meter on the VA-16 board. The hours meter accumulates and records the elapsed time of following modes; threading, standby (STBY), REC, unthreading, REW and EJECT modes. It is recommended that the hours meter is used as a tool for determining the periodic check. When the hours meter indicates the maximum value, 1000 hours, the hours meter must be replaced with a new one. (Sony parts number; 1-548-119-00) Replacement procedure;



3-2-2. Maintenance Time Table

				0:	Cleanin	g ◊	: Chec	k	♦: Rep	lacement
Operating Hours (H)										
Item	Replacement Parts No.	500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	Remarks
Cleaning of the tape movement area.		0	0	0	0	0	0	٥.	0	Perform whenever repair work is attempted
Cleaning or replacement of the belts.	See below	0	0	0	•	0	0	0	•	
Cleaning or replacement of the pinch roller.	X-3676-031-0	0	0	0	•	0	0	0	•	
Cleaning or replacement of the upper drum ass'y.	A-6762-101-A	0	•	0	•	0	•	0	•	Life of the video heads are effected extensively by operating ambient condition.
Check of the FWD back tension. (Replacement of brake band.)	X-3676-049-0	_	♦	_	♦		•	_	♦	
Check of the T soft brake torque. (Replacement of the T soft brake.)	X-3676-021-0		♦	_	♦	_	•	_	♦	
Check of the S soft brake torque, (Replacement of the S soft brake.)	X-3676-056-0		♦	_	♦	_	..	_	•	
Check of the T brake torque. (Replacement of the T brake.)	X-3676-022-0	_	♦		♦	_	♦	_	•	
Check of the FWD torque. (Replacement of the FWD idler ass'y.)	X-3676-026-0	♦	♦	♦	*	♦	♦	♦	•	
Check of the EJECT torque. (Replacement of the EJECT pulley.)	3-676-163-00	_	♦		•	_	♦		•	
Check of the REW torque. (Replacement of the REW pulley)	X-3676-027-0	_	_	_	_	-	_		•	

* NOTE: Parts number of belts

FWD belt: 3-676-175-00
Drum belt: 3-676-059-00
Mechanical belt: 3-676-176-00
EJECT belt: 3-676-178-00

Threading motor belt: 3-676-303-00

3-3. MAINTENANCE AFTER REPAIRS

Perform the following maintenance after repair without regarding the machine operating hours.

- Video heads and stationary heads cleaning. (Referring sec. 3-4)
- Tape movement area cleaning.
 (Referring sec. 3-4)

3-4. CLEANING PROCEDURE

Perform the cleaning as the following procedure.

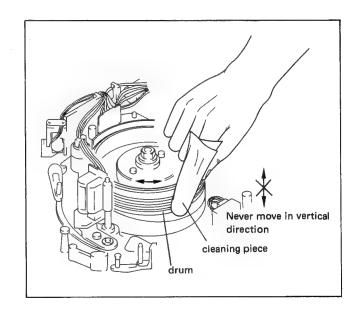
After cleaning insert a cassette after the cleaning fluid evaporate completely.

3-4-1. Video Head

Press the cleaning piece moistened with the cleaning fluid and turn the drum slowly with hand.

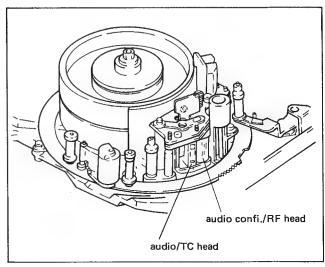
(NOTE) 1 Never move the cleaning piece in the vertical direction of the head tip in the cleaning.

2 Perform the cleaning with the power OFF.



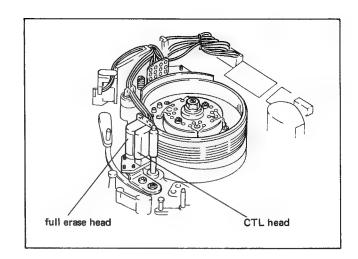
3-4-2. Audio/TC, Audio Confi./RF Head

Clean with the cleaning piece moistened with the cleaning fluid.



3-4-3. CTL, Erase Head

Clean with the cleaning piece moistened with the cleaning fluid.

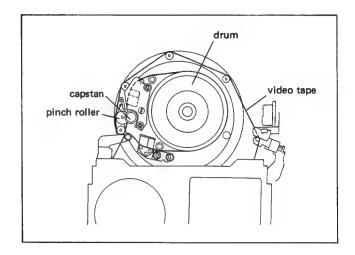


3-4-4. Tape Movement Areas

Wipe the tape bearing surface as shown in the following figure (of the tape guides, drum, capstan and the pinch roller) with a piece of cleaning piece moistened with the cleaning fluid.

(NOTE) Do not clean the surface condensation sensor on the lower drum with the cleaning cloth moistened with the cleaning fluid.

Clean the surface with dry cloth.



3-5. AFTER USED AT SEASIDE OR DUSTY AREAS

It is recommended to check the follow items after the news gathering at seaside or dusty areas.

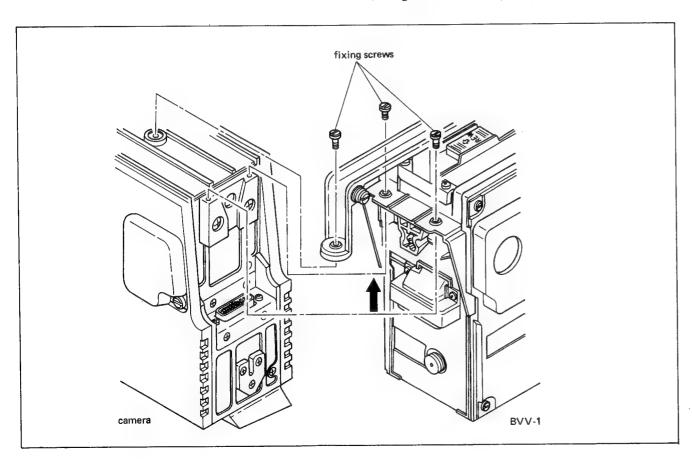
- (1) Wipe off sand and other dust in the BVV-1 with a cleaning piece moistened with the cleaning fluid, or blow off with an air-brush carefully.
- (2) Clean the video head and stationary heads with a cleaning piece moistened with the cleaning fluid.
- (3) Clean the tape movement areas (the drum surface, tape guides, capstan shaft and the pinch roller) with a cleaning piece moistened with the cleaning fluid.
- (4) Clean the belts located to both upper and lower of chassis of BVV-1.
- (5) Clean the surface of the reel tables contacting with the brake shoes.
- (6) Check out any abnormal noise generating or not from the rotating parts such as tape guides, pulley, capstan and the pinch roller, when turns by hand. If noise is generated, replace it with a new one.
- (7) After the news gathering at seaside, remove the printed circuit board (refer sec. 4-3). Clean the printed circuit board with a cleaning piece moistened with the cleaning fluid after blow off sand on the component side with an air-brush completely. Clean the soldering side in the same manners.
- (8) Clean the connector on the connector panel completely. (Disconnect and clean each pins.)
- (9) Perform the operation check and be sure that the machine operates normally.

SECTION 4 SERVICE INFORMATION

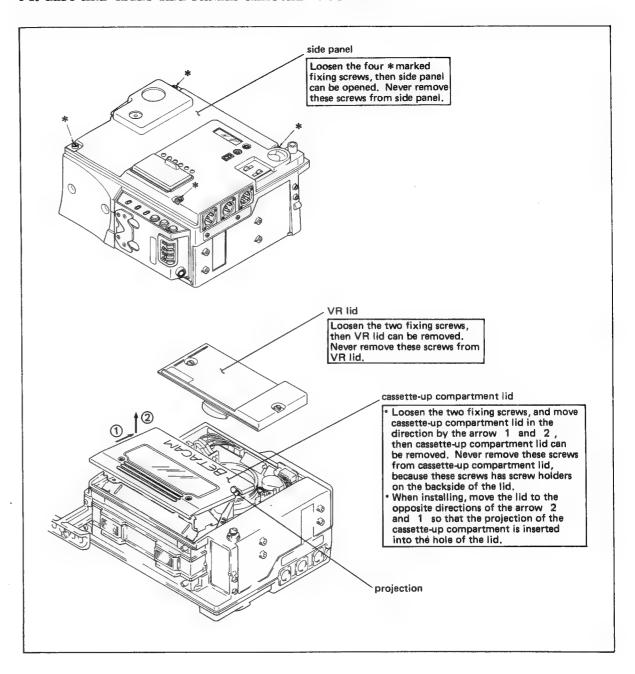
4-1. CAMERA BLOCK REMOVAL FROM VTR AND INSTALLING PROCEDURES

Disassembly and assembly procedures of the camera block and VTR block are follows:

- 1. Disassembly procedure
- (i) Remove three fixing screws as shown in figure.
- (ii) Disassemble the VTR by moving in the direction shown by arrow.
- 2. Assembly procedures
- (i) Assemble the VTR and camera by moving in the opposite directions of what is shown by arrow.
 - If the VTR's 50P connector is not inserted into the camera's connector, slightly move the VTR's connector by hand.
- (ii) Tighten three fixing screws.



4-2. LEFT AND RIGHT SIDE PANELS REMOVAL PROCEDURES



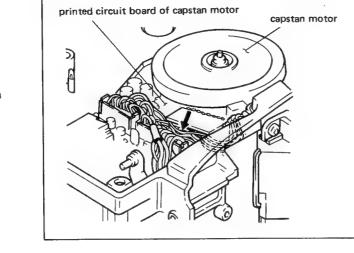
4-3. OPENING AND CLOSING PROCEDURES OF PRINTED CIRCUIT BOARDS

• VA-16 Board

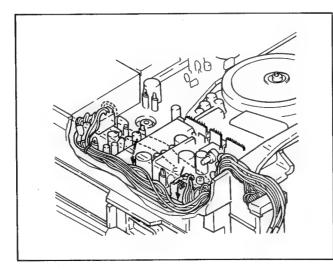
Remove the two fixing screws and then VA-16 board can be opened.

Check the following items when VA-16 board is

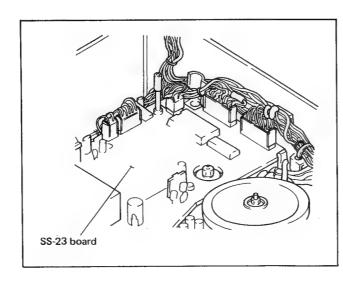
(i) Check that the connector harness for CN001 and CN112/SS-23 board is inserted between the capstan motor and the connector.



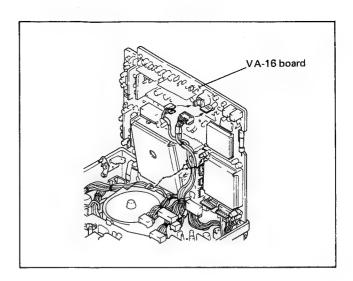
(ii) Check that the connector harness for CN115/ SS-23 board is inserted between the mounted parts and the cabinet.



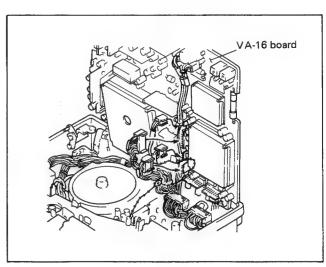
(iii) Check that the connector harness for CN107 and CN108/SS-23 board between the connector and the cabinet.



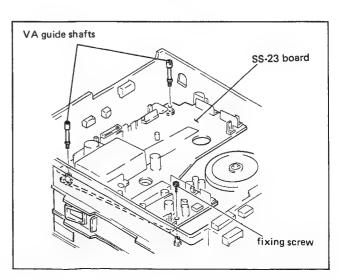
(iv) Check that the connector harness for CN211 and CN210/VA-16 board is banded together with the printed circuit board.



(v) Check that the connector harness for CN201, 202, 203 and 204/VA-16 board is banded together with the printed circuit board.

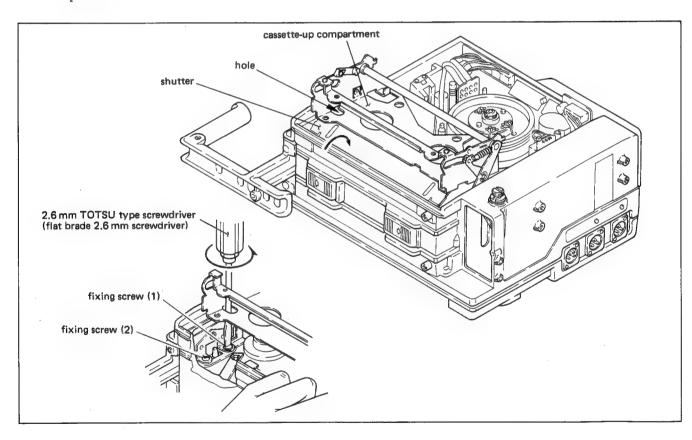


 \bullet SS-23 Board Remove the two VA guide shafts and a screw and then SS-23 board is opened.



4-4. CASSETTE-UP COMPARTMENT REMOVAL PROCEDURES

- (1) Remove the cassette-up compartment lid as referring sec. 4-2. Fixing screws will not be detached since it uses a retainer inside the lid.
- (2) Put the cassette-up compartment in the up state by pushing the EJECT button in the direction of the arrow.
- (3) Insert the 2.6mm TOTSU type screwdriver or equivalent into the left side hole of the cassette-up compartment as shown in figure, and loosen the fixing screw (1) as shown in details. Fixing screws will not be detached since it uses a retainer on the cassette-up compartment.
- (4) Push the shutter in the direction of the arrow by finger, and loosen the fixing screw (2) as shown in details.
- (5) Loosen the right side fixing screws in the same manner as the left side. The cassetteup compartment is now removable from the chassis.



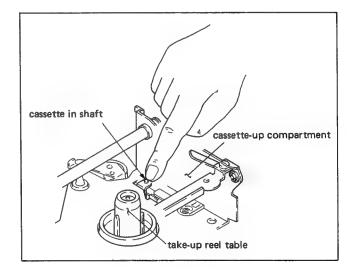
4-5. HOW TO PUT THE VTR INTO REC/PB MODE WITHOUT AN EXCLUSIVE CAMERA

The BVV-1 cannot record the video and audio signals without connecting an exclusive camera. The BVV-1 has not playback circuit. Therefore, in order to put VTR into the REC mode without connecting camera and in order to put VTR into the playback mode for alignment, it is necessary to used the "PB ALIGNMENT CHECKER". For details on the operation of the alignment checker, refer to the instruction manual furnished with it.

4-6. HOW TO PUT THE VTR INTO THREADING COMPLETION MODE WITHOUT CASSETTE TAPE

In this step, the following procedures are described in the state that the cassette-up compartment is mounted to the set. When the cassette-up compartment is removed from the set, the procedures are the same as described here.

- (1) Remove the cassette-up compartment lid as referring sec. 4-2.
- (2) Turn on the POWER switch.
- (3) When the camera is connected with VTR, turn the CAMERA/VTR switch to STANDBY, when "PB Alignment Checker" is connected with VTR, turn the SAVE switch to STANDBY.
- (4) Push down the cassette-up compartment until locked into position.
- (5) Pressing down the cassette in shaft as shown in figure until the threading ring stops it's rotation.
- How to set up the threading operation:
- (6) When the camera is connected with VTR, turn the CAMERA/VTR switch to SAVE, when the "PB Alignment Checker" is connected with VTR, turn the SAVE switch to SAVE.



4-7. SPARE PARTS

- (1) Safety Related Components Warning
 Components identified by shading marked with A on the schematic diagrams, exploded views and electrical spare parts list are critical to safe operation. Replace these components with Sony parts whose part numbers appear in this manual or in service bulletins and service manual supplements published by Sony.
- (2) Replacement parts supplied from Sony Parts
 Center will sometimes have a different
 shape from the original parts. This is due
 to "accommodating the improved parts and/or
 engineering changes" or "standardization of
 genuine parts".

This manual's exploded views and electrical spare parts list indicate the parts numbers of "the standardized genuine parts at present". Regarding engineering parts changes in our engineering department, refer to Sony service bullentins and service manual supplements.

(3) The parts as shown "S" in SP space on the exploded views and electrical spare parts list are normally stocked for replacement purposes. The parts as shown "O" in SP space are not normally required for routine service work. Orders for parts as shown "O" will be precessed, but allow for additional delivery time.

4-8. CHIP PARTS REPLACEMENT PROCEDURE

BVV-1 uses chip parts such as carbon resistor, ceramic capacitor, transistor and diode in some circuits. It also uses IC's of flat-pack type.

As the appearance of carbon resistor and ceramic capacitor are identical, destinguishment of each can be possible by visual check of reference address of silk-screen print on the printed circuit board.

As the shape of transistor and diode are same, they also are distinguished by the reference address of silk-screen print.

Tools:

Soldering iron: 20W

(If possible, use soldering tip heat-controller of $270^{\circ} \pm 10^{\circ}$ C)

Desoldering metal braid ("SOLDER TAUL" or equivalent)

Solder (of 0.6mm dia. is recommended.)

Tweezers

Soldering Conditions:

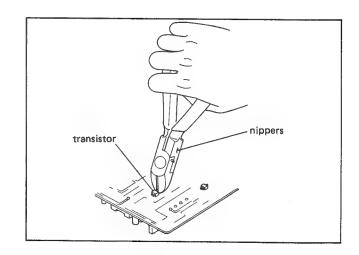
Tip temperature; $270^{\circ} \pm 10^{\circ}$ C Solder within 2 sec. per an electrode

- (1) Resistor and capacitor
- (i) Add heat onto the chip-part by the top of soldering iron tip and slide the chip-part aside when the solder is melted.
- (ii) Confirm visually with care that there is no pattern peeling, damage, and/or bridge where the part was removed or its surrounding.
- (iii) Presolder the pattern into thin where the part was removed.
- (iv) Place a new chip-part onto the pattern and solder both sides.

(CAUTION)

Do not use the chip-part again once used.

- (2) Transistor and diode
- (i) Cut the leads of the semiconductor part to be removed with nippers.
- (ii) Remove the leads cut as the above, and confirm visually that there is no pattern peeling, any damage and/or bridge where the part was removed or its surrounding.
- (iii) Presolder the pattern into thin where the part was removed.
- (iv) Place a new chip-part onto the pattern and solder the leads.



- (3) IC
- (i) Unsolder the pins of IC with desoldering metal braid.
- (ii) Remove the each pin of IC from the pattern by tweezers while heating the pin by soldering iron.
- (iii) Confirm visually with care that there is no pattern peeling, damage, and/or bridge where the part was removed or its surrounding.
- (iv) Place a new IC onto the pattern and solder it.

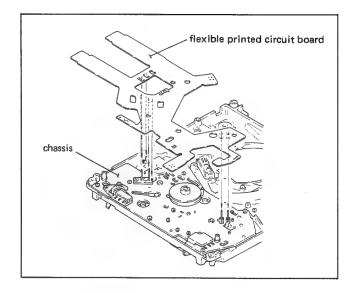
(CAUTION)

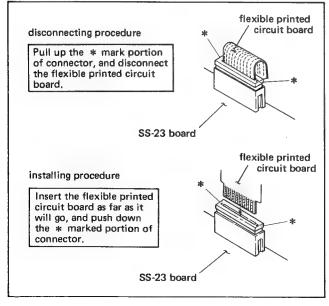
Do not use the chip-part again once used.

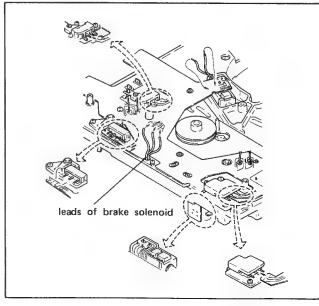
4-9. FLEXIBLE PRINTED CIRCUIT BOARD

The flexible printed circuit board is placed between the mechanical chassis and SS-23 board. This flexible printed circuit board is used for the terminal board of the micro switches, photo-interrupter and so on. Extremely take care to handle the flexible printed circuit board for particularly following items.

- Solder the terminals, using a less than 30W soldering iron.
- The installing and removing procedures of the flexible printed circuit board's connector on SS-23 board are shown in figure.



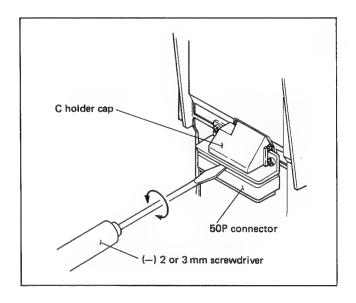




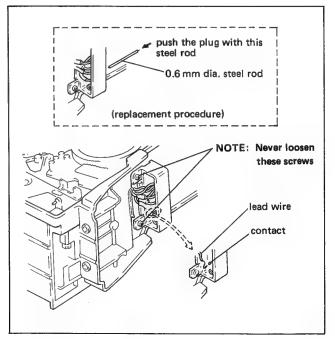
The position of the 50P connector on the VTR is factory calibrated precisely with special tool.

If this position is incorret, the VTR connector cannot be inserted into the camera connector or do not make positive contact with the camera connector. Therefore do not remove the V connector holder and 50P connector by removing the fixing screws as shown in figure, except special case.

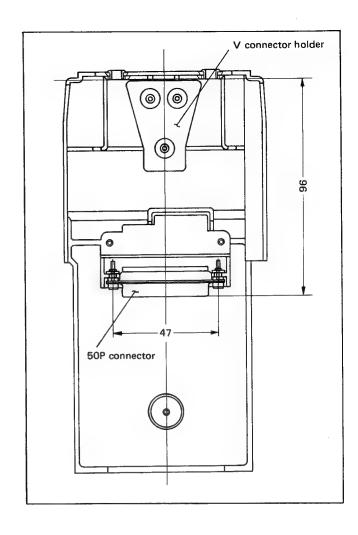
 When you check the 50P connector portion, remove the C holder cap as shown in figure.



- If the lead wire is happened to be open at the 50P connector portion, solder the lead wire with contact.
- If the connector indicates a poor contact with the plug, remove the contact as shown in fugure and replace it with a new one.



 If the V connector holder and 50P connector are removed, install these parts until it meets the specified value by using a rule.
 After installation, check that the connection of the VTR and camera is firmly connected.



4-11. CASSETTE TAPE REMOVAL PROCEDURE WHEN TAPE SLACK IS ACTIVATED

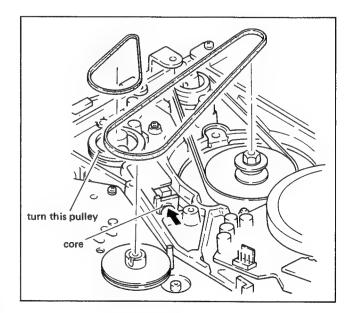
Tape slack is detected with the reel rotation detector beneath the take-up reel table. If the take-up reel table is stoped its rotation more than about 0.25sec, by any reason in the REC mode, the machine detects as the tape slacks in the machine. The machine stops all mode to avoid tape damage. If the take-up reel table is stopped its rotation more than about 0.3sec, by any reason in the EJECT mode, the machine detects as the tape slacks in the machine same as in REC mode. The machine stops all mode.

In this case, the cassette tape can be removed from the machine by the following procedures. Locate the cause of the trouble and remedy the problem.

- When the tape slack is detected in use of external power supply.
- Turn off the POWER on the external power supply.
- (2) Remove the VR lid.
- (3) Turn on the POWER once on the external power supply. Check as soon as possible that the threading ring rotates in the unthreading direction (clockwise direction) and the tape is taken up to the take-up reel tabel at the same time. If it is not to meets the both conditions, turn off the POWER quickly.
 - When the threading ring does not rotate in the unthreading direction, perform steps
 (4) and following steps.
 - . When the threading ring rotetes in the unthreading direction but the tape is not taken up to the take-up reel table, perform steps (8) and following steps.
- When the tape slack is detected in use of internal battery.
- (1) Remove the VR lid.
- (2) Remove the battery lid.

- (3) Reinsert the battery after disconnect the internal battery. At this time, check as soon as possible that the threading ring rotates in the unthreading direction (clockwise direction) and the tape is taken-up to the take-up reel table at the same time. If it is not to meet the both conditions, disconnect the internal battery quickly.
 - When the threading ring does not rotate in the unthreading direction, perform steps
 (4) and following steps.
 - . When the threading ring rotates in the unthreading direction but the tape is not taken up to the take-up reel table, perform steps (8) and following steps.
- Tape Removal Procedure
- (4) Open the side panel, and open the VA-16 and SS-23 boards (refer to sec. 4-2, 4-3).
- (5) Remove the two belts as shown in figure.
- (6) While pushing the core of the solenoid in the direction of the arrow as shown in figure, turn the pulley three or four turns in the clockwise direction viewing from back side of the machine.
- (7) Release the finger from the core, and turn the pulley in the clockwise direction until the threading ring comes in the fully unthreading position.
- (8) While holding down the cassette-up compartment lid by hand, move the EJECT button to maximum 10mm distance in the direction of the arrow, and return the EJECT button to the original position.

Check that the supply reel table rotates and takes-up the tape remaining in the machine.



(CAUTION)

When you push the EJECT button as far as it will go in the direction of the arrow, EJECT button is locked and cassette-up compartment has risen up. But the tape is remaining in the machine so the tape is damaged. Therefore take care that the EJECT button is not locked in this step. If the EJECT button is locked, hold the cassette tape lid so that it does not close, and rise up the cassette-up compartment slowly by releasing the holding hand of the cassette-up compartment. Remove the tape remaining in the machine carefully so that it does not damage.

- (9) Repeat step (8) until the remaining tape is taken up to the supply reel table.
- (10) Push and lock the EJECT button as far as it will go in the direction of the arrow, and remove the tape from the cassette-up compartment.

(NOTE)

- (1) When the threading ring does not rotate in the unthreading direction, it seems that the cause of this trouble is power supply system.
- (2) When the threading ring rotates in the unthreading direction but the tape is not taken up to the take-up reel table, it seems that the cause of this trouble is EJECT belt cutting, take-up reel shaft burning, or mulfunction of brake or FWD solenoid.

4-12. ALIGNMENT FIXTURE

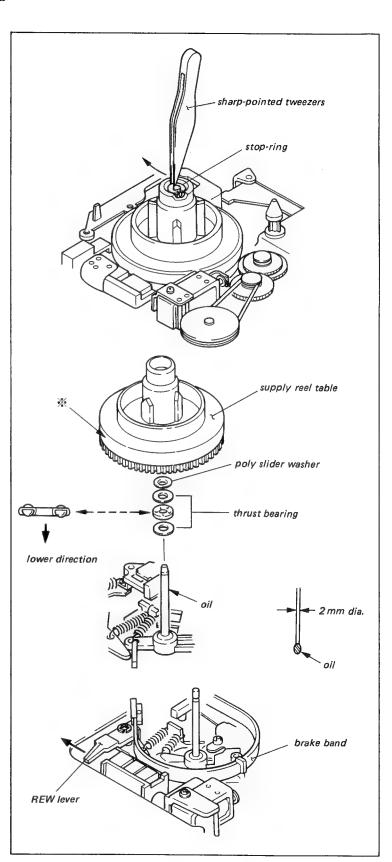
Part Number	Description	For Use					
J-6001-820-A	Drum Eccentricity Gauge (3)						
J-6001-830-A	Drum Eccentricity Gauge (2)						
J-6001-840-A	Drum Eccentricity Gauge (1)	Upper drum eccentricity adjustment					
J-6087-000-A	Drum Eccentricity Gauge (5)						
J-6080-008-A	Cassette Reference Plate	Reel table adjustment					
J-6080-011-A	Reel Table Tension Gauge	REW torque measurement					
J-6080-013-A	Dihedral Adjustment Screw	Video head dihedral adjustment					
J-6086-570-A	Flatness Plate	Audio/TC head zenith adjustment					
J-6190-800-A	Tension Regulator Slantness Check Tool						
J-6195-360-A	BVV-1 PB Alignment Checker	Video tracking and stationary heads position adjustments					
Y-2031-001-0	Cleaning Fluid	\					
2-034-697-00	Cleaning Piece	Cleaning					
3-702-390-01	Eccentricity Driver (4mm dia.)	TC head position adjustment					
7-732-050-01	Tension Scale (20g full scale)	Torque and back tension adjustment					
7-732-050-20	Tension Scale (50g full scale)						
7-732-050-30	Tension Scale (100g full scale)						
7-732-050-40	Tension Scale (200g full scale)	1)					
7-732-050-50	Tension Scale (500g full scale)	1					
7-723-902-00	Inspection Mirror	Video tracking adjustment					
8-960-097-02	Alignment Tape, CR2-1	Video tracking tape for player					
8-960-097-03	Alignment Tape, CR2-3	Video tracking tape for recorder					
8-960-097-22	Alignment Tape, CR5-1	Video, audio and servo alignments for recorder and player					
9-911-053-00	Thickness Gauge	Clearance check					
Standard Products	Head Demagnetizer (HE-4)	Head demagnetize					

SECTION 5 REPLACEMENT OF MAJOR PARTS

5-1. REPLACEMENT OF SUPPLY REEL TABLE

Mode:Unthreading end

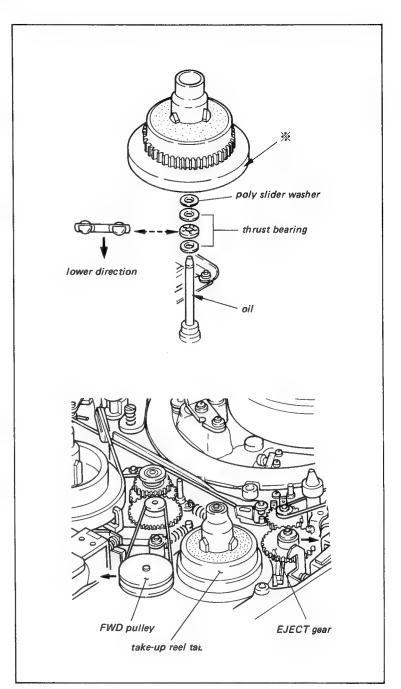
- Remove the stop-ring on top of the reel table with a sharppointed tweezers as shown in figure.
- (2) Remove the reel table. Check that the thrust bearing and poly slider washer have remained on the reel shaft. When they are removed with reel table, install them on the reel shaft as shown in figure.
- (3) Clean the reel shaft with a cloth moistened with cleaning fluid.
- (4) Apply a drop of sony oil on the reel shaft as shown in figure. Amount of oil should be one drop that is scooped by tip of 2mm diameter twig such as pencil lead.
- (5) Clean the * marked portion of the reel table with a cloth moistened with cleaning fluid.
- (6) While pressing the REW lever to the arrow direction, install the reel table on the reel shaft. Be careful not to damage the brake band.
- (7) Perform the sec. 6-1 Reel Table Height Adjustment. After adjustment, install the stop ring on the upper portion of the reel table.
- (8) Perform the adjustment as sec. 5-21.



5-2. REPLACEMENT OF TAKE-UP REEL TABLE

Mode: Unthreading end

- (1) Remove the stop-ring on top of the reel table with a sharp-pointed tweezers.
- (2) Remove the reel table while pressing the EJECT gear and the FWD pulley in the direction of the arrow. Check that the thrust bearing and poly slider washer have remained on the reel shaft. When they are removed with the reel table, install them on the reel shaft as shown in figure.
- (3) Clean the reel shaft with a cloth moistened with cleaning fluid.
- (4) Apply a drop of sony oil on the reel shaft as shown in figure.
- (5) Clean the * marked portion of the reel table with a cloth moistened with cleaning fluid.
- (6) While cancelling the two brakes and pushing the EJECT gear and FWD pulley in the direction of the arrows, install the reel table on the reel shaft.
- (7) Perform the sec.6-1 reel table height adjustment. After adjustment, install the stop ring on the upper portion of the reel table.
- (8) Perform the adjustments as sec.5-21.



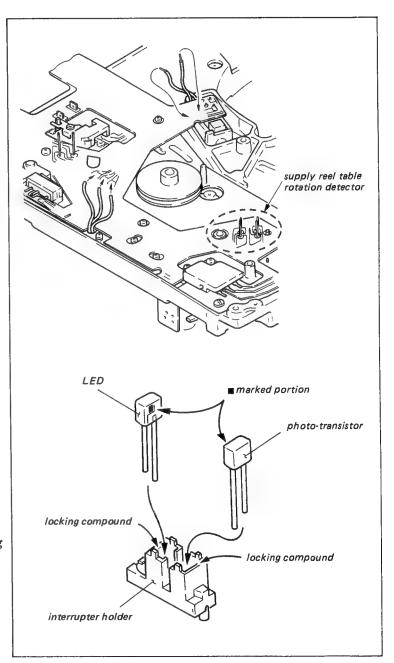
5-3. REPLACEMENT OF SUPPLY REEL TABLE ROTATION DETECTOR

. Since the LED for the rotation detector and the photo- transistor are pasted with a locking compoud to the interrupter holder, replace the following three parts simultaneously.

8-719-103-15 : LED

8-729-101-13 : Photo-transistor 3-676-258-00 : Interrupter holder

- (1) Open the VA-16 and the SS-23 boards.
- (2) Unsolder the terminals of the LED and the photo-transistor from the FL board.
- (3) Remove the supply reel table Check that the thrust bearing and poly slider washer have remained on the reel shaft. When they are removed with the reel table, install them on the reel shaft as shown in figure (see sec. 5-1).
- (4) Remove the interrupter holder
- (5) Insert the LED on the interrupter holder so that the ■ marked portion of the LED is closest to the photo-transistor location.
 - The installing position is as shown in figure.
- (6) Insert the photo-transistor on the interrupter holder so that the ■ marked portion of the photo-transistor is closest to the LED location.
- (7) press the LED and the photo-transistor to the interrupter holder and paste with a locking compound at the position as shown in figure.
- (8) Install the interrupter holder.
- (9) Solder the terminals on the FL board.
- (10) Install the supply reel table referring sec. 6-1.



5-4. REPLACEMENT OF TAKE-UP REEL TABLE ROTATION DETECTOR

. Since the LED for the rotation detector and the photo-transistor are pasted with a locking compound to the interrupter holder, replace the following three parts simultaneously.

8-719-103-15 : LED

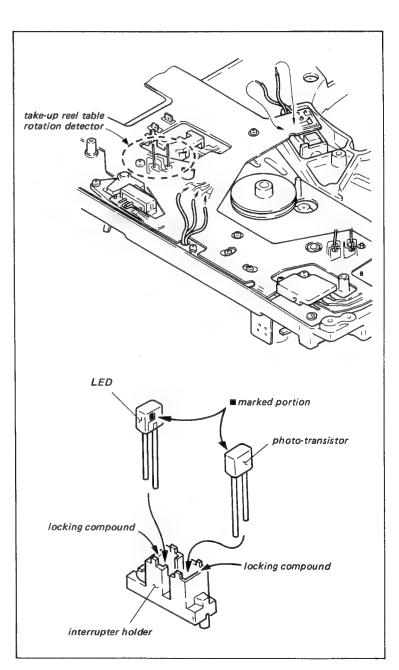
8-729-101-13: Photo-transistor 3-676-258-00: Interrupter holder

Replacement procedure:

- (1) Open the VA-16 and the SS-23 boards.
- (2) Unsolder the terminals of the LED and the photo-transistor from the FL board.
- (3) Remove the mounting screw of the interrupter holder on the back of the chassis.
- (4) Lift up the FL board lightly, remove the interrupter holder.
- (5) Insert the LED on the interrupter holder so that the ■ marked portion of the LED is closest to the photo-transistor location.

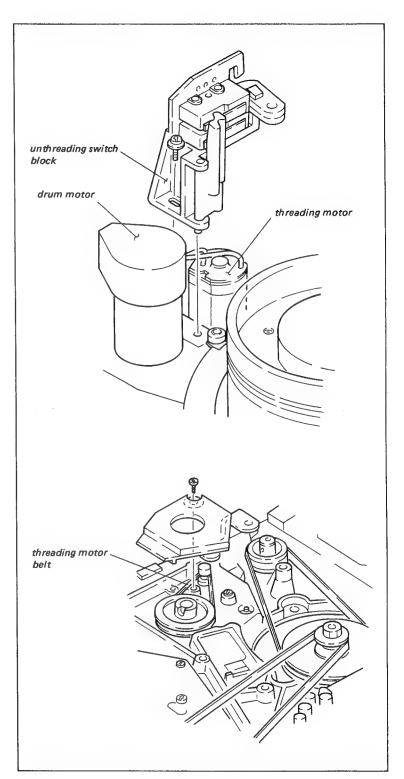
The installing position is as shown in figure.

- (6) Insert the photo-transistor on the interrupter holder so that the ■ marked portion is closest to the LED location.
- (7) Press the LED and the phototransistor to the interrupter holder and paste with a locking compound at the position as shown in figure.
- (8) Install the interrupter holder.
- (9) Solder the terminals on the FL board.



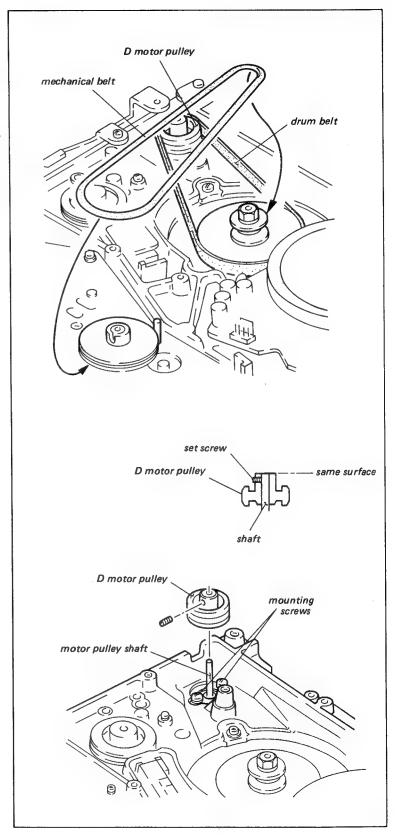
5-5. REPLACEMENT OF THREADING MOTOR

- Disconnect the threading motor connector, CN308 from the TR board.
- (2) Remove the unthreading switch block.
- (3) Open the VA-16 and the SS-23 boards.
- (4) Remove the threading motor belt.
- (5) Replace the threading motor with the new one.
- (6) Reassemble by reversing steps.



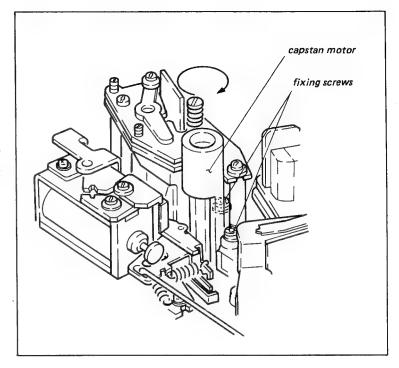
5-6. REPLACEMENT OF DRUM MOTOR

- (1) Open the VA-16 and the SS-23 boards.
- (2) Remove the drum and mechanical belts.
- (3) Remove the D motor pulley with allen wrench (each edge has 0.89mm).
- (4) Remove the TR board.
- (5) Replace the drum motor with the new one.
- (6) Install the D motor pulley through the motor shaft and install the motor shaft so that the positional relationship of the D motor pulley and motor shaft meets the required specification.
- (7) Clean the drum and mechanical belts and install the belts
- (8) Perform the adjustments as sec. 5-21.



5-7. REPLACEMENT OF CAPSTAN MOTOR

- (1) Remove the audio head block.
- (2) Open the VA-16 and the SS-23 boards.
- (3) Disconnect capstan motor connector, CN 112 from SS-23 board.
- (4) Remove the two fixing screws as shown in figure and remove the capstan motor.
- (5) Install the capstan motor. While turning the capstan motor in the clockwise direction viewing from top of the set and tighten the fixing screws.
- (6) Perform the adjustments as sec. 5-21.



5-8. REPLACEMENT OF UPPER DRUM

. The rotary video heads cannot be replaced individually, the whole upper drum assembly must be replaced when any one of these heads fails.

Tool: Drum eccentricity gauge (1)

Drum eccentricity gauge (2)

Drum eccentricity gauge (3)

Drum eccentricity gauge (5)

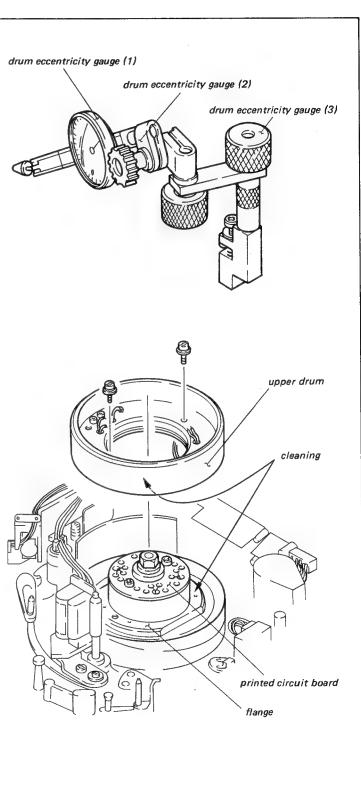
Cleaning fluid

Cleaning piece

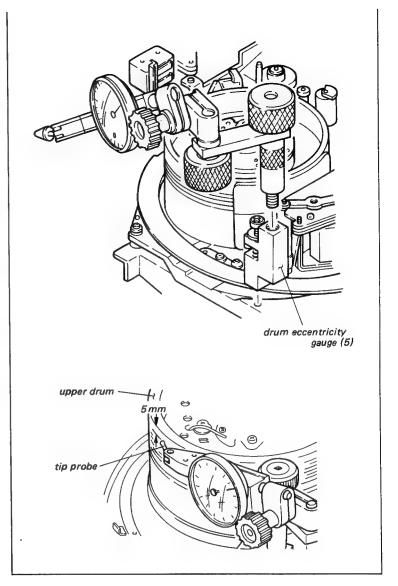
Replacement procedure:

- (1) Unsolder the eight leads of the printed circuit board.
- (2) Remove the two screws and remove the upper drum.
- (3) Clean the matching surfaces of the flange and new upper drum assembly with a cloth moistened with cleaning fluid. (If there is a spacer between drum and flange, it should be remain in place, or be reinstalled in the same place with the new upper drum assembly. The spacer is 0.01mm, 0.03mm, 0.05mm or 0.1mm thick.)
- (4) Place the upper drum assembly so that the head of the white, yellow and orange leads is closest to the marked A of the printed circuit board and thread snugly with two screws but do not tighten.

- (1) Remove the TR board.
- (2) Assemble the drum eccentricity gauge (1),(2),(3) and (5) as shown in figure. Mount the assembled gauges on the machine so that the tip probe positiones at the point about 5mm apart from the top edge of the upper drum.

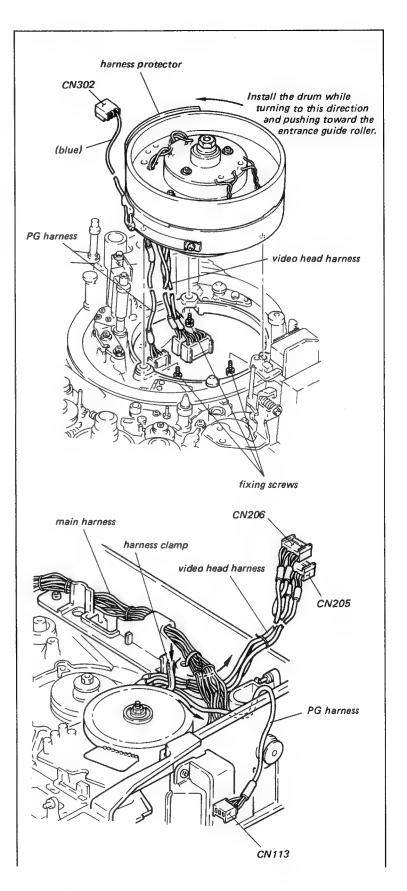


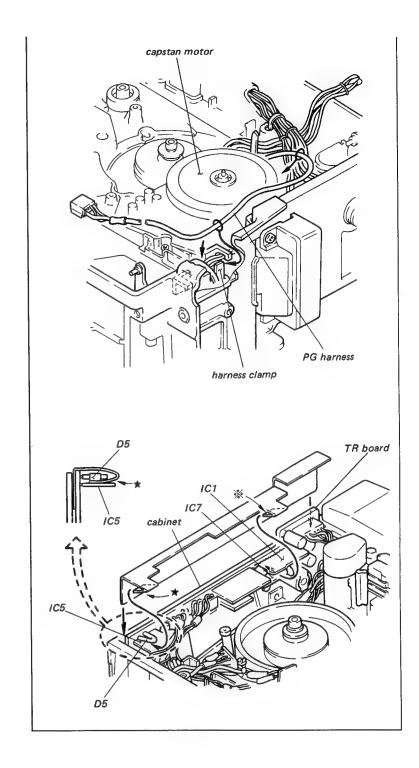
- (3) Turn the upper drum slowly clockwise pointer direction and confirm the deflection of the gauge is within 5micron during one complete turn of the upper drum. If specification is this step (5). If it satisfied, proceed then continue with is not, perform remaining steps.
- (4) Tap the inside of the upper drum with a nylon hammer or a screwdriver handle so that the gauge deflection remains within 5micron.
- (5) After the adjustment, tighten the two screws that are securing the upper drum, alternately and gradually using a tightening torque: 8 Kg.cm
- (6) After the screws are tightened, check again that the eccentricity of the upper drum is within 5micron.
- (7) Solder the eight leads from the video heads to the printed circuit board.
- (8) Perform the adjustment as sec. 5-21.



5-9. REPLACEMENT OF DRUM ASSEMBLY

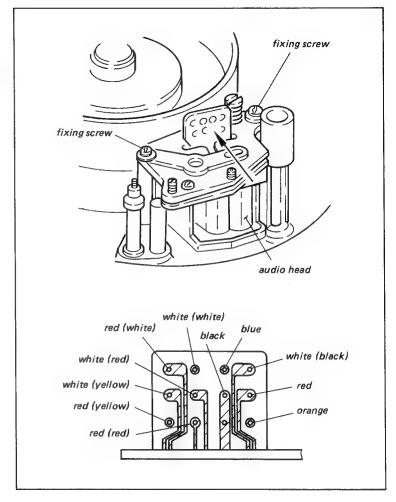
- (1) Open the VA-16 and the SS-23 boards.
- (2) Disconnect the four connectors, CN113/ SS-23 board, CN205 and CN206/VA-16 board and CN2/TR-15 board.
- (3) Remove the three fixing screws on the back of the set and remove the defective drum.
- (4) Install the drum on the base while turning the drum ass'y in the counterclockwise direction and pushing the drum toward the entrance tape guide viewing from the top of set.
- (5) Arrange the drum harness as shown in figure and insert the connector.
- (6) Perform the adjustments as sec. 5-21.





5-10. REPLACEMENT OF AUDIO HEAD

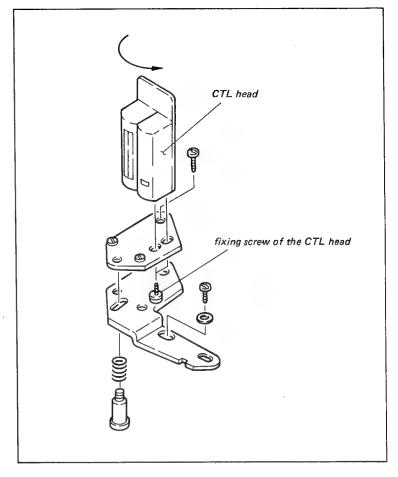
- (1) Remove the harness from the audio head.
- (2) Remove the audio head block.
- (3) Replace the audio head, and tighten the audio head while pushing the audio head in the direction of the arrow.
- Solder the harness as shown in figure.
- (4) Install the audio head block and perform the adjustments as sec.5-21.



5-11. REPLACEMENT OF CTL HEAD

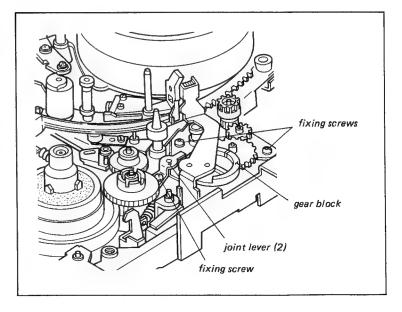
Replacement procedure:

- (1) Remove the harness from the CTL head and connect it to the new CTL head.
- (2) Remove the CTL head block.
- (3) Remove the fixing screws of the CTL head.
- (4) Install the new CTL head to the CTL head block while turning the head to the direction as shown in figure.
- (5) Install the CTL head block and perform the adjustments as sec. 5-21.



5-12. REPLACEMENT OF GEAR BLOCK

- (1) Remove the EJECT belt.
- (2) Remove the fixing screw of the joint lever (2).
- (3) Open the VA-16 and the SS-23 boards.
- (4) Remove the threading motor belt and pulley.
- (5) Remove the two fixing screws of gear block and remove the gear block.
- (6) Install the new gear block. Perform the adjustments as sec. 5-21.

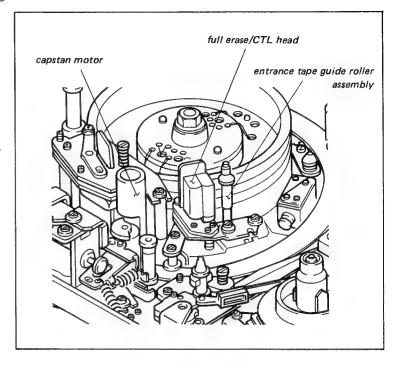


5-13. REPLACEMENT OF ENTRANCE TAPE GUIDE ROLLER ASSEMBLY

. The component parts of the entrance tape guide roller ass'y cannot be replaced individually since the entrance tape guide roller ass'y is prepared as a whole assembly as shown in figure.

Replacement procedure:

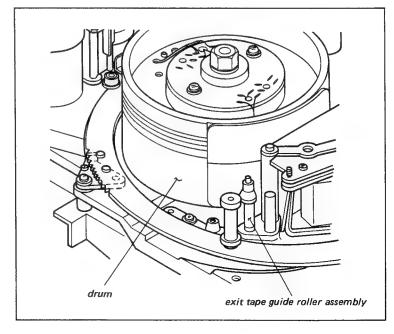
- (1) Remove the audio head block.
- (2) Open the VA-16 and the SS-23 boards.
- (3) Remove the capstan motor.
- (4) Remove the fixing screw on the back of chassis and replace the entrance tape guide roller ass'y.
- (5) Install the capstan motor and the audio head block (see sec.5-7 and sec. 5-10).
- (6) Perform the adjustments as sec. 5-21.



5-14. REPLACEMENT OF EXIT TAPE GUIDE ROLLER ASSEMBLY

• The component parts of the exit tape guide roller ass'y cannot be replaced individually since the exit tape guide roller ass'y is prepared as a whole assembly as shown in figure.

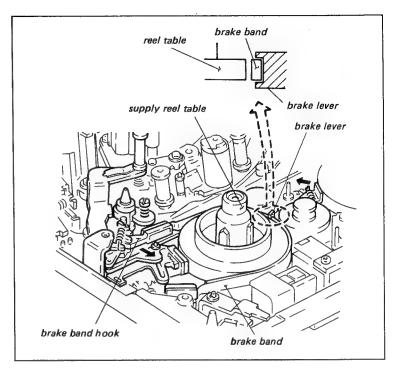
- (1) Open the VA-16 and the SS-23 boards.
- (2) Remove the fixing screw of exit tape guide roller ass'y on the back of the chassis and replace the exit tape guide roller ass'y.
- (3) Perform the adjustments as sec. 5-21.



5-15. REPLACEMENT OF BRAKE BAND

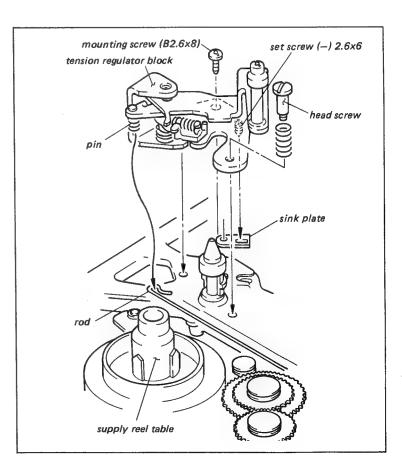
Replacement procedure:

- (1) Remove the supply reel table. (See sec.5-1) Check that the thrust bearing and poly-slider washer have remained on the reel shaft. When they are removed with the reel table, install them on the reel shaft as shown in figure (see sec.5-1).
- (2) Pull out the brake band hook in the direction of the arrow and remove it.
- (3) Remove the brake band.
- (4) Install the new brake band. Insert the brake band between the two claws of the brake lever as shown in figure.
- (5) After replacement, perform the adjustments as sec. 5-21.



5-16. REPLACEMENT OF TENSION REGULATOR BLOCK

- (1) Remove the head screw and mounting screw.
- (2) Remove pin of the tension regulator block from the rod and then remove the tension regulator block.
- (3) Check that the sink plate is positioned as shown in figure.
- (4) Hook the new tension regulator pin onto the rod.
- (5) Insert the projection on the bottom of tension regulator into the hole of the chassis and screw the mounting screw (B2.6 x 8) about 3 to 4 turns.
- (6) Replace the compression spring on the head screw. Install the tension regulator block to the chassis.
- (7) Remove the set screw (-)2.6 x 6 from the old tension regulator block and screw it about 4 to 5 turns into new block.
- (8) After replacement, perform the adjustments as sec. 5-21.



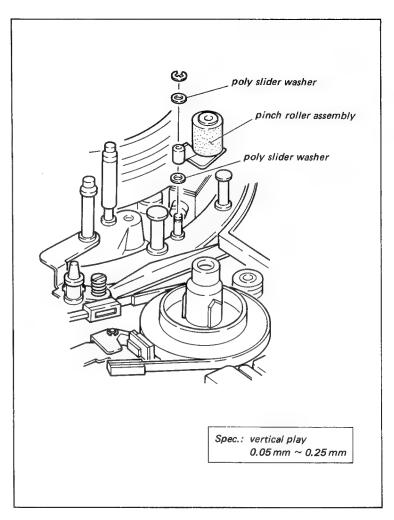
5-17. REPLACEMENT OF PINCH ROLLER ASSEMBLY (INCLUDING THE VERTICAL PLAY ADJUSTMENT)

Replacement procedure:

- (1) Remove the pinch roller ass'y from the threading ring.
- (2) Never remove the poly slider washer beneath the pinch roller ass'y as shown in figure.
- (3) Install the replacement pinch roller ass'y.
- (4) Insert the polyslider washer at the upper portion of pinch roller ass'y and secure it with an E type retaining ring.
- (5) Push up and down the pinch roller ass'y for inspection. Adjust the polyslider washer on top of the pinch roller ass'y so that the vertical play meets the required specification.

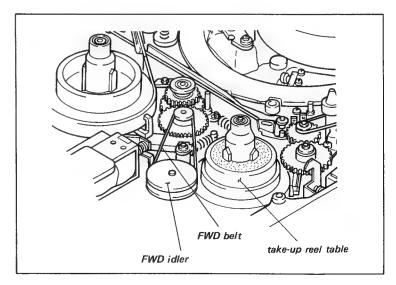
Adjustment poly-slider washer 3-701-436-01 1.6mm dia. 0.13mm thick 3-701-436-11 1.6mm dia. 0.25mm thick 3-701-436-21 1.6mm dia. 0.5 mm thick

(6) Put the machine into the threading completion mode.
Perform the sec.6-6-6 Pinch Press Lever Height Adjustment. After replacement, confirm the step (5).



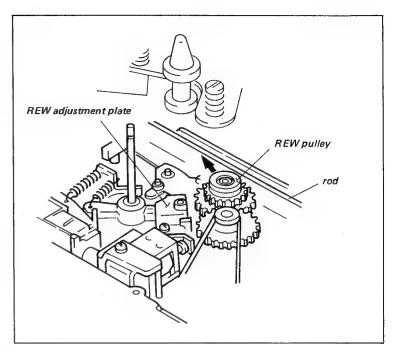
5-18. REPLACEMENT OF FWD IDLER

- (1) Remove the FWD belt.
- (2) Remove the E type retaining ring and remove the FWD idler.
- (3) Clean the shaft with a cloth moistened with cleaning fluid.
- (4) Apply a drop of oil at the top portion of the shaft.
- (5) Install the new idler.
- (6) Perform the adjustments as sec.5-21.



5-19. REPLACEMENT OF REW PULLEY

- (1) Remove the supply reel table (see sec. 5-1). Check that the thrust bearing and poly slider washer have remained on the reel shaft. When they are removed with the reel table, install them on the reel shaft as shown in sec.5-1.
- (2) Remove the REW adjustment plate.
- (3) Remove the cap of the REW pulley in the same manner as the reel table replacement
- (4) Remove the REW pulley while pressing the REW pulley in the direction of the arrow and pressing the rod to the drum simultaneously.
- (5) Clean the shaft with a cloth moistened with cleaning fluid.
- (6) Thread the poly slider washer (2mm dia. 0.25mm thick) through the shaft and apply a drop of oil at the top portion of the shaft.
- (7) Install the new REW pulley.
- (8) After installing, perform the sec. 6-2-3 REW adjustment plate position adjustment.
- (9) Apply a drop of oil on the supply reel shaft and install the reel table (see sec.5-1).



5-20. REPLACEMENT OF REED SWITCH

Mode: Take finger off the cassette in shaft when the threading ring is rotate about 180 degrees from the unthreading end state.

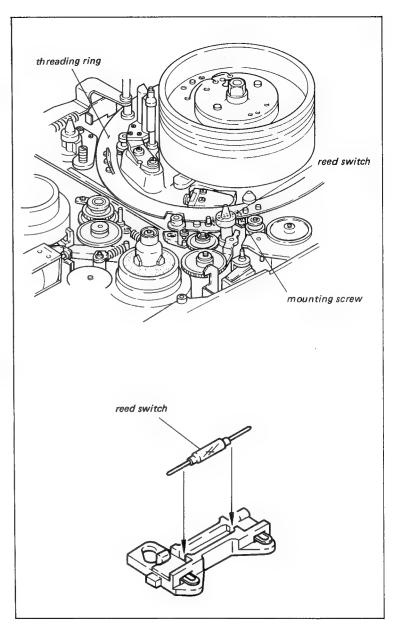
Replacement procedure:

- (1) Put the machine in the above mode.
- (2) Open the VA-16 and SS-23 board.
- (3) Unsolder the jumper leads on the flexible board FL-7 from the reed switch.
- (4) Remove the reed switch block.
- (5) Remove the reed switch.
- (6) Solder the new reed switch to the switch terminal.

(CAUTION)

Do not apply soldering iron for more than 3 seconds on any one terminal.

(7) Install the reed switch block on the VTR and adjust the position.



5-21. ADJUSTMENT ITEM TABLE AFTER MAIN PARTS REPLACEMENT

Replacement of Supply Reel Table Reel Table Height Adjustment (6-1) S Soft Brake Torque Adjustment (7-1) (When the tracking adjustment is performed, adjust referring "Adjustment steps of Tracking Adjustment", described on Sec. 8 Adjustment Information.) Replacement of Take-up Reel Table Reel Table Height Adjustment (6-1) - T Soft Brake Torque Adjustment (7-2) T Main Brake Torque Adjustment (7-3) - FWD Torque Measurement (7-5) Tape Run Adjustment (T Drawer Guide Slantness Adjustment) (8-1-2) Replacement of Threading Motor Tape Run Adjustment (T Drawer Guide Slantness Adjustment) (8-1-2) --- Servo System Adjustment Replacement of Upper Drum Upper Drum Eccentricity Adjustment (5-8) - Video Tracking Adjustment (8-2) (When the tracking adjustment is performed, adjust referring "Adjustment Steps of Tracking Adjustment", described on Sec.8 Adjustment Information.) - Video Head Dihedral Adjustment (8-3) - CTL Head Position Adjustment (8-4) --- TC Head Position Adjustment (8-5) --- Switching Position Adjustment (8-6) - Video Head Overlap Amount Check (8-7) - Video System Adjustment Replacement of Drum Assembly - Adjust referring "Adjustment Steps of Tracking Servo System Adjustment -Adjustment Replacement of Drum Motor Servo System Adjustment Replacement of Capstan Motor Press Mechanism Block Position Adjustment (6-6-5) ------ Tape Run Adjustment

Around Pinch Roller (8-1-1) ——Video Tracking Adjustment (8-2) (When the tracking adjustment is performed, adjust referring "Adjustment Steps of Tracking Adjustment", described on Sec. 8 Adjustment Information) ———Servo

System Adjustment

Replacement of Audio/TC Head

Audio/TC Head Zenith Adjustment (8-13)——Audio Head Height Adjustment (8-11)——Audio Head Phase Adjustment (8-12)——Audio Confi. Head Tape to Head Contact Adjustment (8-14)——Audio Head Phase Adjustment (8-12)——Audio/TC Head Zenith Adjustment (8-13)——Video Tracking Adjustment (8-2)(When the tracking adjustment is performed, adjust referring "Adjustment steps of Tracking Adjustment", described on Sec.8 Adjustment Information.)——TC Head Position Adjustment (8-5)——Audio System Adjustment——Time Code System Adjustment

Replacement of CTL Head

CTL Head Azimuth Adjustment (8-8) —— CTL Head Height Adjustment (8-9) —Full Erase/CTL Head Zenith Adjustment (8-10) —— Video Tracking Adjustment (8-2) (When the tracking adjustment is performed, adjust referring "Adjustment Steps of Tracking Adjustment", described on Sec.8 Adjustment Information.) —— CTL Head Position Adjustment (8-4) —— TC Head Position Adjustment (8-5) —— Audio System Adjustment

Replacement of Gear Block

Gear Block Position Adjustment (6-5-1) — Joint Lever (2) Position Adjustment (6-4-3)

Replacement of Entrance Roller Guide Ass'y/Exit Roller Guide Ass'y

Adjust referring "Adjustment Steps of Tracking Adjustment", described on Sec.8 Adjustment Information.

Replacement of Brake Band

Replacement of Tension Regulator Block

Tension Regulator Slantness Adjustment (6-4-1) — Gear Block Position Adjustment (6-5-1) — Tension Regulator Operating Position Adjustment (6-4-2) — T Coil Sensor Position Adjustment (6-7) — Joint Lever (2) Position Adjustment (6-4-3) — FWD Back Tension Adjustment (7-4) — Video Tracking Adjustment (8-2) — Adjust referring "Adjustment Steps of Tracking Adjustment", described on Sec.8 Adjustment Information.

Replacement of Pinch Roller

Thread End Position Adjustment (6-5-3)——Stopper Arm B Position Adjustment (6-5-4)——Threading End Switch Position Adjustment (6-5-5)——Pinch Press Mechanism Block Position Adjustment (6-6-5)——Tape Run Adjustment Around Pinch Roller (8-1-1)

SECTION 6 LINK AND DRIVE SYSTEM ALIGNMENT

ALIGNMENT INFORMATION

MODE

. Unthreading end mode

It means EJECT completion mode.

The threading guide, tension regulator arm and threading ring are put back at the cassette tape side completely.

. Threading end mode

- (1) Connect the Head Amp. block of PB alignment checker to VTR.
- (2) Turn the SAVE/STNADBY switch of checker into STANDBY.
- (3) Keep pushing the cassett in shaft till the threading ring rotation is stopped.

This state means the threading end mode.

. Threading mode

- (1) Connect the Head Amp. block of the PB alignment checker to VTR.
- (2) Turn the SAVE/STANDBY switch of checker into STANDBY.
- (3) Push the cassette in shaft and rotate the threading ring. Threading mode means that this threading ring is rotating.

. PLAY mode without cassette tape

- (1) Connect the Head Amp. block of the PB alignment checker to VTR.
- (2) Turn the SAVE/STANDBY switch of checker into STANDBY.
- (3) Keep pressing the cassette in shaft till the threading ring rotation is stopped.
- (4) Turn the START/STOP switch of checker into START. This state means the PLAY mode without cassette tape.

. PLAY mode

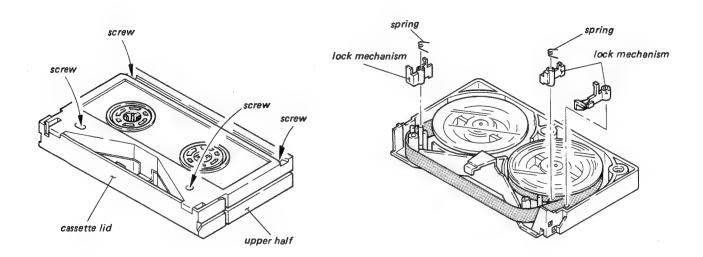
- (1) Connect the Head Amp. block of the PB alignment tape to VTR.
- (2) Insert a cassette tape into VTR.
- (3) Turn the SAVE/STANDBY switch of checker into STANDBY. (Threading starts)
- (4) Turn the START/STOP switch of checker into START. This state means the PLAY mode.

HOW TO MAKE THE CASSETTE TAPE WITHOUT LID

Since the VTR is designed compact size, the check and adjustment can not be performed if cassette tape lid is installed.

The cassette tape lid removal procedures are as follows:

- (1) Remove the four screws on the back of the cassette as shown in figure, and remove the upper half of the cassette.
- (2) Remove the lock mechanism parts and the springs on the left and right.
- (3) Remove the cassette lid from the upper half.
- (4) Install the upper half on the lower half with four screws from the back side.



6-1. REEL TABLE HEIGHT ADJUSTMENT

.Adjust the reel table so that it's position is 0.13mm higher than the adjusted position by the limit gauge of the cassette reference plate, proper tape path can then be obtained.

Mode: Unthreading end

Tool: cassette reference plate

Adjustment procedure:

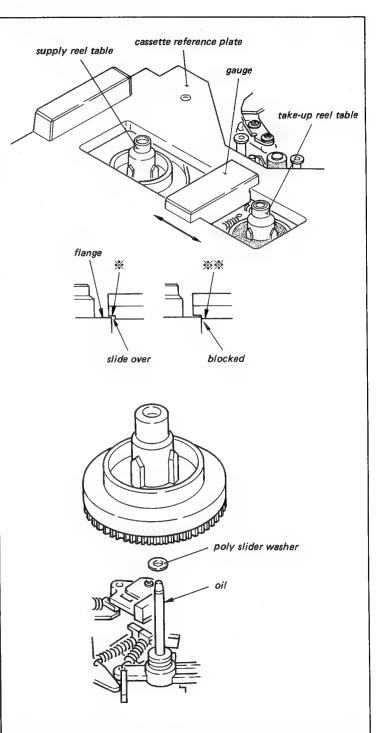
- (1) Put the cassette reference plate in the cassette position.
- (2) Move the gauge as shown in figure. Adjust height by varying the number of washers under the reel table so that the * marked portion of the gauge can slide over the reel table, while the ** marked portion is blocked, and cannot slide over reel table.
- (3) After completing step (2), insert a poly slider washer, 0.13mm thick, under the reel table.
- (4) Apply a drop of SONY oil at the position as shown in figure and install the reel table.

poly slider washer for adjustment

0.13mm thick: 3-701-439-01

0.25mm thick: 3-701-439-11

0.5mm thick: 3-701-439-21



6-2. FUNCTION SYSTEM ADJUSTMENT

6-2-1. FWD Solenoid Position Adjustment

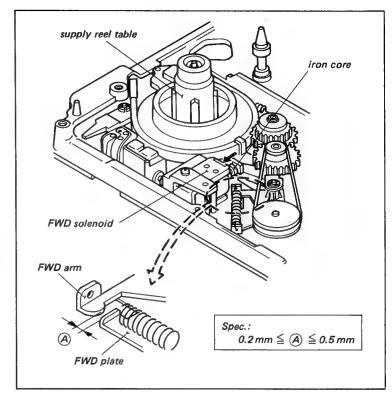
Mode: Unthreading end

Check procedure:

- Push the iron core into the fully energized position in the direction of the arrow.
- (2) Check that the clearance between the FWD plate and the FWD arm meets the required specification.

Adjustment procedure:

- (1) Open the VA-16 and the SS-23 boards.
- (2) Loosen the two screws of the FWD solenoid from rear of the chassis. Adjust the position of the FWD solenoid so that it meets the required specification.



6-2-2. FWD Stopper Position Adjustment

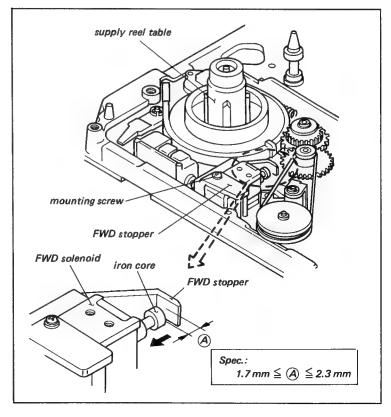
Mode: Unthreading end

Check procedure:

- (1) Push the iron core into the fully energized position in the direction of the arrow.
- (2) Check that the clearance between the end of iron core and the FWD stopper meets the required specification.

Adjustment procedure:

 Adjust the position of the FWD stopper so that it meets the required specification.



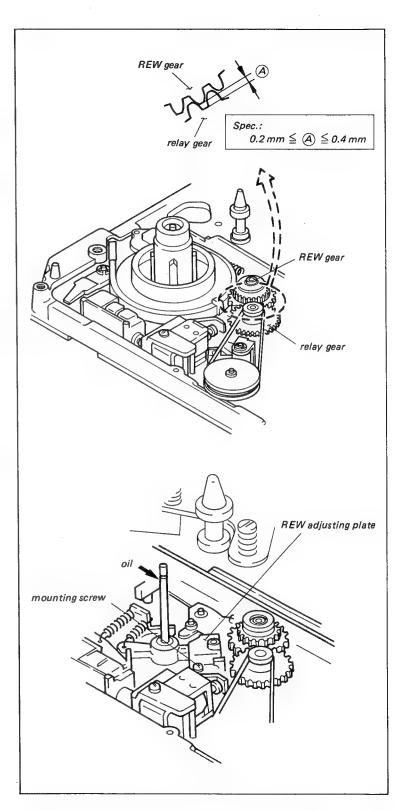
6-2-3, REW Adjusting Plate Position Adjustment

Mode: Unthreading end

Check procedure:

- (1) Push the REW button to the left as far as it will go.
- (2) Check that the clearance between the REW gear and the relay gear meets the required specification.
- (3) Return the REW button to the home position. Check that the REW gear does not contact with relay gear.

- (1) Remove the supply reel table.
 - Check that the thrust bearing and the poly slider washer remain on the reel shaft. When the thrust bearing and the poly slider washer are removed with reel table, install them on the reel shaft as shown in sec 5.
- (2) Adjust the position of the REW adjusting plate so that it meets the required specification.
- (3) Apply a drop of oil on the supply reel shaft and install the reel table. (See sec. 5.)



6-2-4. Arm Adjusting Plate Position Adjustment

Mode: Unthreading end

Check procedure:

- (1) Push the EJECT button to the right as far as it will go.
- (2) Check that the clearance between the EJECT prohibition plate and the EJECT arm meets the required specification.

- (1) Use string to hold the EJECT button in position so that the clearance between the EJECT prohibition plate and the EJECT arm can be checked.
- (2) Loosen the mounting screw of the arm adjusting plate about one turn.
- (3) Insert the flatblade screw driver,2mm dia. into the notch of arm adjusting plate. Turn the driver so that the required specification is met while pressing the roller of the stopper arm B to the threading ring.
- (4) Tighten the screw and confirm as check procedure.

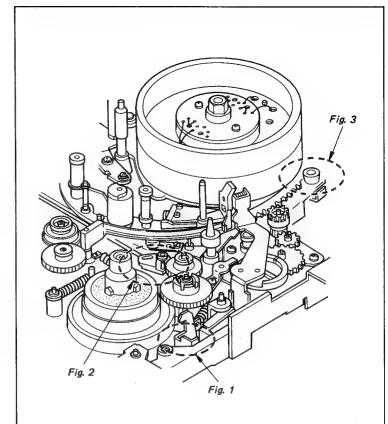
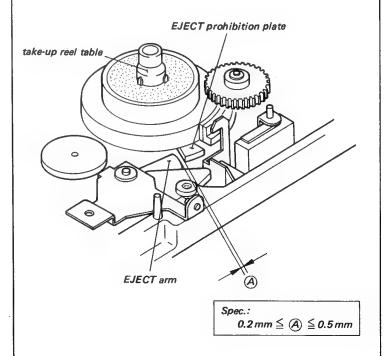
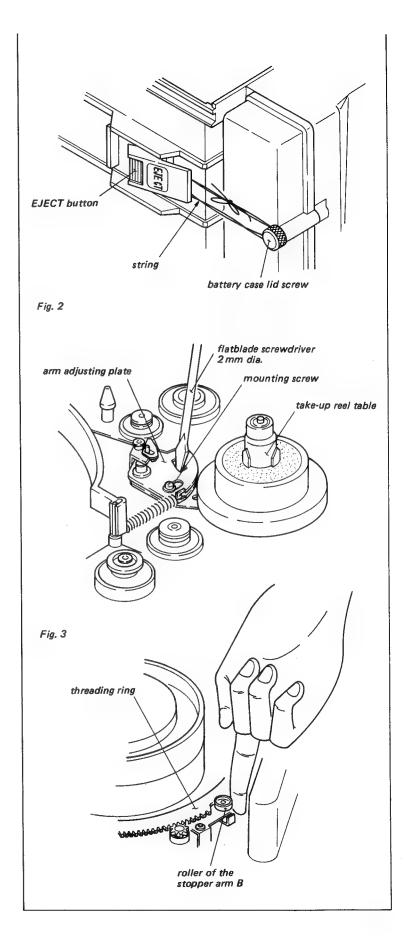


Fig. 1





6-3. BRAKE SYSTEM ADJUSTMENT

6-3-1. T Brake Solenoid Position Adjustment

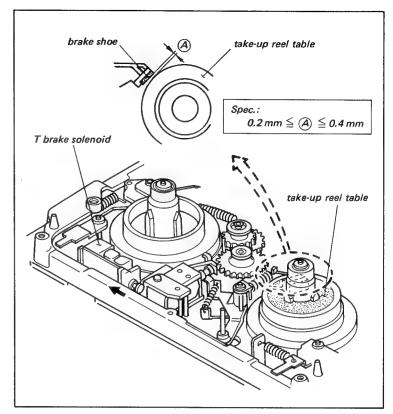
Mode: Unthreading end

Check procedure:

- (1) Push the iron core of the T brake solenoid into the fully energized position in the direction of the arrow.
- (2) Check that the clearance between the take-up reel table and the brake shoe meets the required specification.

Adjustment procedure:

- (1) Open the VA-16 and the SS-23 boards.
- (2) Loosen the two mounting screws of T brake solenoid from rear of the chassis and adjust the position of the T brake solenoid so that it meets the required specification.



6-3-2. S Soft Brake Clearance Adjustment

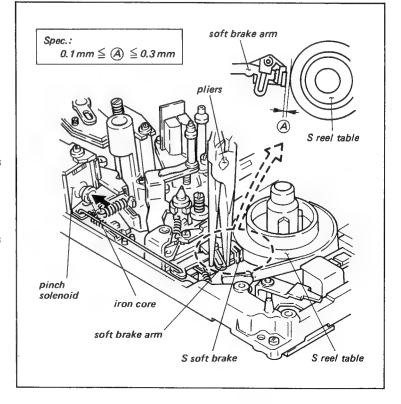
Mode: Unthreading end

Check procedure:

- (1) Push the iron core of the pinch solenoid into the fully energized position in the direction of the arrow.
- (2) Check that the clearance between the S reel table and the S soft brake meets the required specification.

Adjustment procedure:

 Adjust the soft brake arm with pliers so that the required specification is met.



6-4.TENSION REGULATOR SYSTEM ADJUSTMENT

6-4-1. Tension Regulator Slantness Adjustment

.This adjustment is closely related with the video tracking adjustment.

.Perform the video tracking adjustment after this adjustment.

Tool: PB alignment checker

Cassette reference plate

Tension regulator slantness check tool Alligator clip

Mode: Threading end

Check procedure:

(1) Clip the tension regulator arm and the pin with the alligator clip as shown in figure.

(Crush the tip of the alligator clip with pliers.)

- (2) Install the cassette reference plate. Put the cassette reference plate in the cassette position.
- (3) Place the tension regulator slantness check tool against the tension regulator roller. Check that the slantness of the roller meets the required specification viewing from the direction of the arrows A and B as shown in figure.

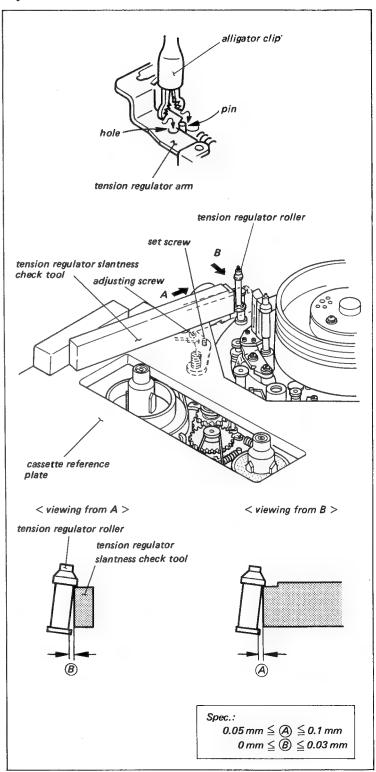
Adjustment procedure:

- .When the slantness is out of spec. viewing from the direction of the arrow B:
- (1) Adjust the slantness with the set screw.
- .When the slantness is out of spec. viewing from the direction of the arrow A:
- (2) Adjust the slantness with the adjusting screw.
- (3) Confirm as check procedure (3).
- (4) After adjustment, perform the following adjustment;

Sec.6-4-2 Tension regulator operating position adjustment

Sec.6-5-1 Gear block position adjustment

Sec.6-4-3 Joint lever (2) position adjustment



6-4-2. Tension Regulator Operating Position Adjustment

It is required that the sec. 6-4-1 Tension regulator slantness adjustment, and sec. 6-5-1 Gear block position adjustment are checked to be correct or properly adjusted before initiating this adjustment.

Tool: Slide vernier caliper or equivalent PB alignment checker Alligator clip

Mode: Threading end

Check procedure:

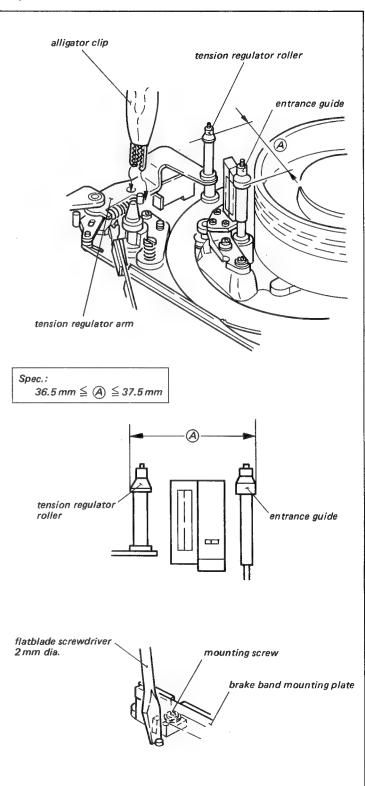
- (1) Clip the tension regulator arm and the pin with the alligator clip as shown in figure.
- (2) Check that the distance between the flanges of the entrance guide and the tension regulator roller meets the required specification.

Adjustment procedure:

- (1) Loosen the mounting screw of the brake band mounting plate about 1/3 to 1 turn.
- (2) Adjust the position of the brake band mounting plate with a flatblade screw driver, 2mm dia. so that it meets the required specification.
- After adjustment, perform the following adjustments;

Sec. 6-7 T coil sensor position adjustment

Sec. 6-4-3 Joint lever (2) position adjustment.



6-4-3. Joint Lever (2) Position Adjustment

It is required that the sec.6-4-1 Tension regulator slantness adjustment, sec.6-4-2 Tension regulator operat ing position adjustment, and sec.6-5-1 Gear block position adjustment are checked to be correct or properly adjusted before initiating this adjustment.

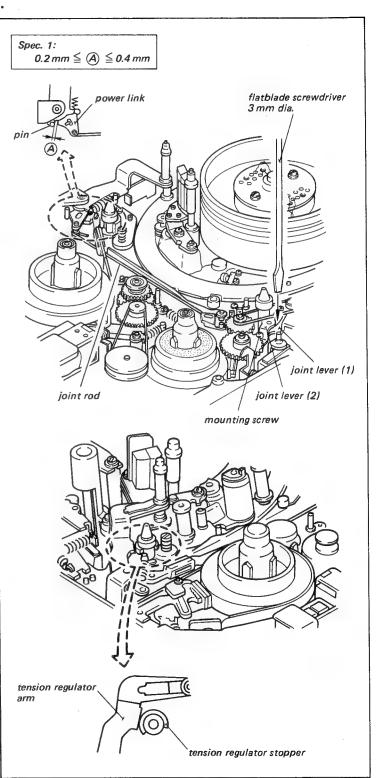
Tool: PB alignment checker

Mode: Threading end/Unthreading end

Check procedure:

- (1) Check the clearance between the power link and the pin so that it meets the required specification (1) in the threading end state.
- (2) Put the machine into the unthreading end state.
- (3) Check that the tension regulator arm is in contact with the tension regulator stopper. (Spec.2)

- (1) Loosen the mounting screw of the joint lever (2) about one or two turns.
- (2) Insert a flatblade screw driver,3mm dia. between the joint lever (1) and (2). Adjust the position of the joint lever (2) so that meets the required specification(1).
- (3) Check the spec.(2). If the spec.(2) is out of spec., adjust the position of the joint lever (2) within the limits of spec.(1).



6-5.THREADING SYSTEM ADJUSTMENT

6-5-1. Gear Block Position Adjustment

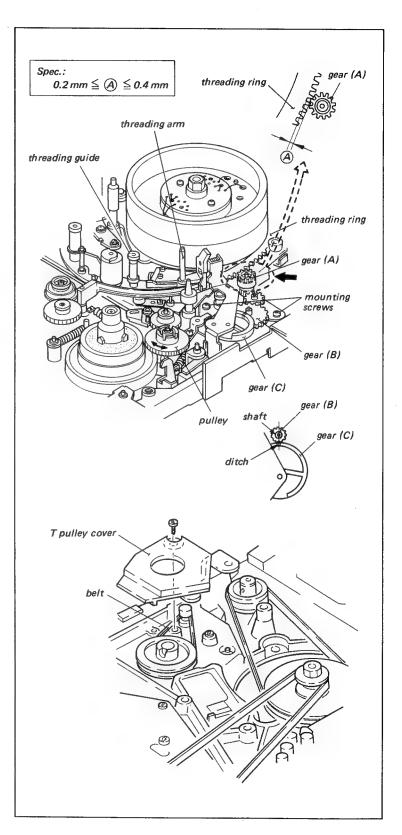
Tool: PB alignment checker

Mode: Unthreading end/Threading

Check procedure:

- (1) Put the machine into the unthreading end mode.
- (2) Check that the clearance between the gear (A) and threading ring meets the required specification.
- (3) Insert the cassette-tape.
- (4) Check that the threading arm does not hit against the threading guide in the threading mode.

- (1) Put the machine into the unthreading end mode.
- (2) Open the VA-16 and the SS-23 boards.
- (3) Remove the T pulley cover and the belt as shown in figure.
- (4) Loosen the mounting screws of the gear block, and disengage the gear from the threading ring.
- (5) Turn the pulley by hand so that it meets the positional relationship between the notch of gear (c) and the shaft of gear (B) as shown in figure.
- (6) Move the gear (A) in the direction of the arrow so that it meets the required specification.
- (7) Confirm as check procedures (3) and (4). When the threading arm hits against the threading guide, perform the following steps.
- (8) Perform adjustment procedures (1) to (5).
- (9) Disengage the gear (A) and the threading ring. Turn the gear (A) one tooth in clockwise direction and engage again.
- (10)Confirm as adjustment procedures (6) and (7).
- (11)After adjustment, perform the sec.6-4-3
 Joint lever(2) position adjustment.



6-5-2. Ring Stopper B Height Adjustment

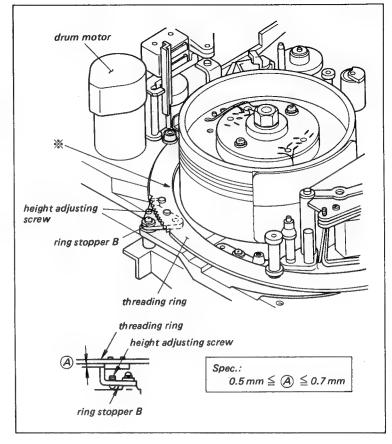
Tool: Inspection mirror **Mode:** Unthreading end

Check procedure:

- (1) Remove the TR board.
- (2) Lift up the * marked portion of the threading ring lightly. Check that the clearance between the threading ring and the ring stopper B meets the required specification with the inspection mirror.

Adjustment procedure:

(1) Adjust the height adjusting screw of the ring stopper B so that meets the required specification.



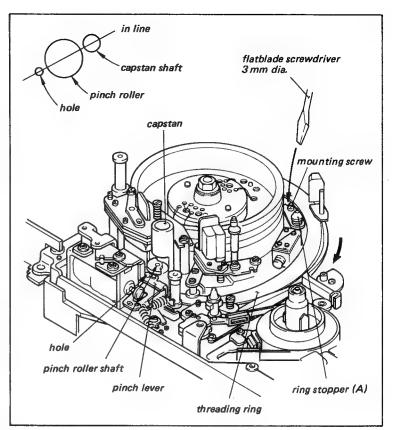
6-5-3. Thread End Position Adjustment

Tool: PB alignment checker

Mode: Threading end Check procedure:

- (1) Put the machine into the threading end mode.
- (2) While pressing the threading ring in the direction of the arrow by hand, check that the center of pinch roller shaft is in line with the capstan shaft and the hole in the pinch lever as shown in figure.

- (1) Loosen the mounting screw of the ring stopper (A) about 1/4 to 1/2 turn.
- (2) Insert m flatblade screwdriver,3mm dia. between the notch of ring stopper (A) and the boss. While pressing the threading ring in the direction of the arrow by hand, adjust the position of the ring stopper (A) so that it meets the required specification.
- (3) Repeat the unthreading and threading modes two or three times and check that the positional relationship meets the required specification.
- (4) After adjustment, perform the sec.6-5-4 Stopper arm B position adjustment.



6-5-4. Stopper Arm B Position Adjustment

.It is required that the sec.6-5-3. Thread end position adjustment is checked to be correct or properly adjusted before initiating this adjustment.

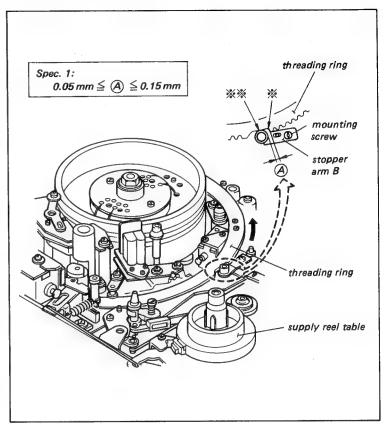
Tool: PB alignment checker

Mode: Threading end

Check procedure:

- (1) While pushing the threading ring in the direction of the arrow by hand, check that the clearance between * marked portion of the threading ring and the roller of the stopper arm B meets the required specification (1).
- (2) Check that the roller of the stopper arm B contacts with the ** marked portion of the threading ring (spec.2).

- (1) While pushing the threading ring in the direction of the arrow by hand, adjust the position of the stopper arm B so that meets the required specifications (1) and (2).
- (2) Repeat the unthreading and the threading modes two or three times and check to meet the required specifications (1) and (2).



6-5-5. Thread End Switch Position Adjustment

Jt is required that the sec. 6-5-4 Stopper arm B position adjustment is checked to be correct or properly adjusted before initiating this adjustment.

Tool: Circuit tester

PB alignment checker

Thickness gauge

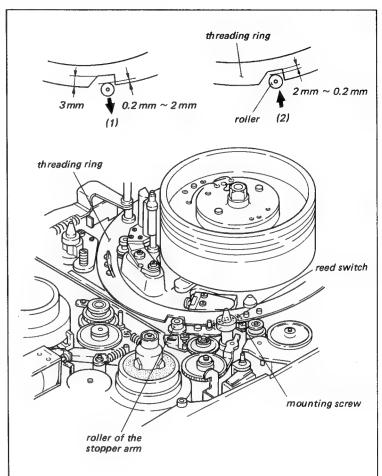
Mode: Threading end

Check procedure:

- (1) Open the VA-16 board.
- (2) Connect the circuit tester to the IC104 pin4 on SS-23 board.
- (3) Turn the power on. Check that the circuit tester indicates 5V.
- (4) Move the roller of the stopper arm in the direction of the arrow(1). Check that the circuit tester indicate 0V when the roller is placed between 0.2mm to 2mm from the outer circumference of the threading ring. (Spec.1)
- (5) Move the roller of the stopper arm in the direction of the arrow (2). Check that the circuit tester indicate 5V when the roller is placed between 2mm to 0.2mm from the indented portion of the threading ring.(Spec.2)

Adjustment procedure:

 Loosen the screw as shown in figure and adjust the position of the reed switch.



6-6. PINCH PRESS MECHANISM ADJUSTMENT

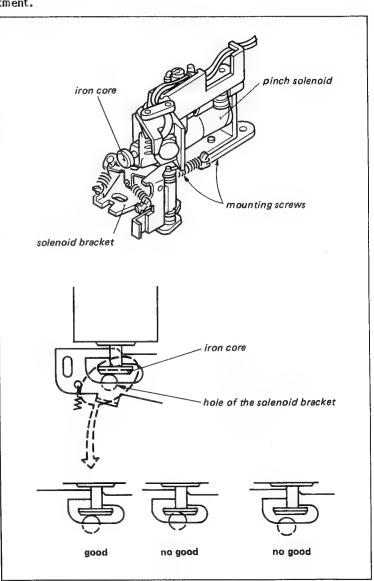
6-6-1. Pinch Solenoid Position Adjustment

.This adjustment is usually not required. Proceed with the following step only when the pinch solenoid is replaced or removed. Remove the pinch press mechanism from the set in this adjustment.

Check procedure:

- (1) Push the iron core of the pinch solenoid into the fully energized position with finger.
- (2) Check that the positional relationship between the top of the iron core and the hole of the solenoid bracket meets the required specification as shown in figure.

- (1) Loosen the mounting screws of the pinch solenoid and adjust the position of the solenoid so that meets the required specification.
- (2) After adjustment, perform the following adjustment; Sec.6-6 All of the pinch press mechanism adjustments Sec.8-1-1 Tape run adjustment (around the pinch roller).



6-6-2. Pinch Pressure Adjustment

.Remove the pinch press mechanism from the set in this adjustment.

Tool: String for measurement(Make a loop about 15cm long as shown in figure.)

Tension scale (500g full scale)

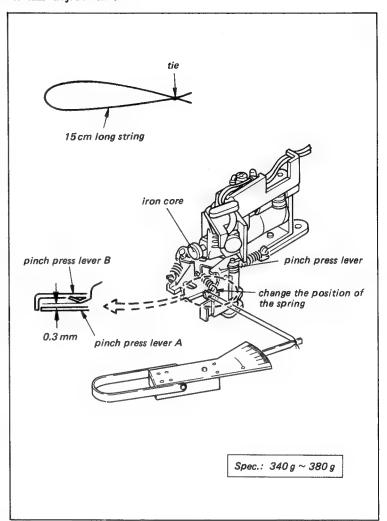
Check procedure:

- (1) Hook the string on the pinch press lever as shown in figure and hook a tension scale on an end of the string.
- (2) While pressing the iron core of the pinch solenoid into the energized position with finger, move the tension scale in the right angle direction of the pinch press lever.
- (3) Move the tension scale so that the clearance between the pinch press lever A and B is about 0.5mm (visual check) and return the tension scale slowly. When the clearance is about 0.3mm (visual check) check that the scale reading meets the required specification.

Adjustment procedure:

the pinch roller).

- (1) Change the position of the spring as shown in figure so that it meets the required specification.
- (2) After adjustment, perform the following adjustments; Sec. 6-6-5 Pinch press mechanism block position adjustment Sec. 8-1-1 Tape run adjustment (around



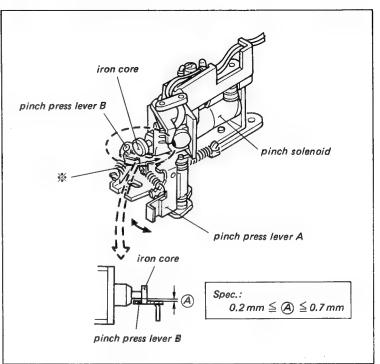
6-6-3. Pinch Press Lever B Position Adjustment

.This adjustment is required only when the pinch solenoid and the pinch press lever B are replaced or removed. Remove the pinch press mechanism from the set in this adjustment.

Check peocedure:

- (1) Check that the clearance between the iron core of the pinch solenoid and the pinch press lever B meets the required specification.
- (2) When press the A portion of the pinch press lever in the direction of the arrow as far as it will go, check that this operation is smooth.

- (1) Bend the * marked portion of the pinch press lever B with pliers so that meets the required specification.
- (2) After adjustment, perform the following adjustments; Sec. 6-6-5 Pinch press mechanism block position adjustment Sec. 8-1-1 Tape run adjustment (around the pinch roller).

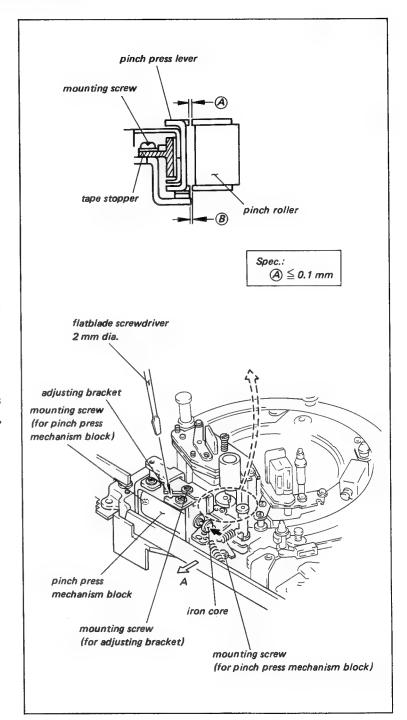


6-6-4(i). PINCH PRESSURE LEVER SLANTNESS ADJUSTMENT

Mode: Threading end

- Loosen the two mounting screws of the pinch press mechanism block.
- (2) Move the pinch press mechanism block in the direction of the arrow A, then tighten the pinch press mechanism block with two screws.
- (3) Loosen the mounting screw of the tape stopper about 1/2 to 1 turn.
- (4) Loosen the mounting screw of the adjusting bracket about 1/4 to 1/2 turn.
- (5) Push the iron core of the pinch solenoid into the fully energized position in the direction of the arrow.
- (6) Insert a flatblade screwdriver, 2mm dia. into the notch of the adjusting bracket. Adjust the position of the adjusting bracket so that the clearance between the upper and lower flanges of the pinch roller and the pinch press lever to meet the required specification.
- (7) After adjustment, perform the sec. (ii)

 Tape stopper position adjustment.

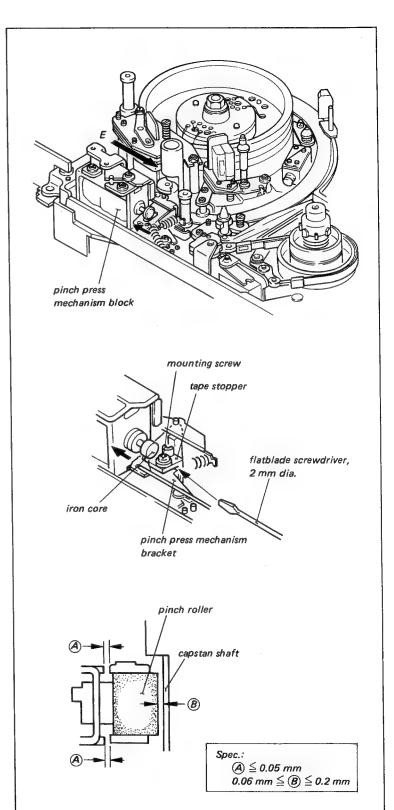


6-6-4 (ii). TAPE STOPPER POSITION ADJUSTMENT

.It is required that the sec. (i) Pinch pressure lever slantness adjustment is checked to be correct or properly adjusted before initiating this adjustment.

Mode: Threading end Adjustment procedure:

- (1) Insert a flatblade screwdriver, 2mm dia. or equivalent between the pinch press mechanism bracket and the tape stopper on the pinch press mechanism block.
- (2) Adjust the position of the tape stopper with flatblade screwdriver in step 1 so that meets the clearance between the pinch roller and the capstan shaft, when viewing from the direction of the arrow E.
- (3) Push the iron core of the pinch solenoid into the fully energized position in the direction of the arrow.
- (4) Tighten the mounting screw of the tape stopper.
- (5) Pull out the iron core of the pinch solenoid from the energized position in the opposite direction of the arrow.
- (6) Check that the clearance B meets the required specification.
- (7) Check that the clearance A meets the required specification.
- (8) After adjustment, perform sec.6-6-5 Pinch press mechanism block position adjustment.



6-6-5. Pinch Press Mechanism Block Position Adjustment

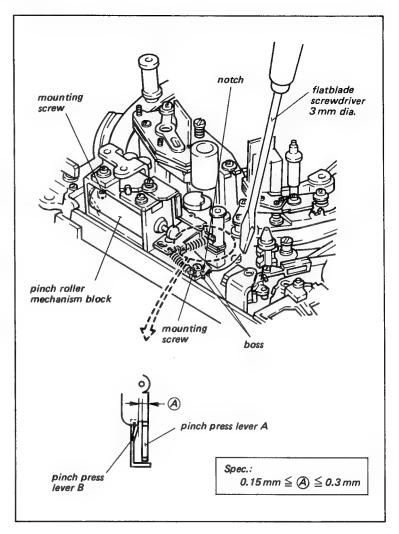
Tool: PB alignment checker

Mode: PLAY mode without cassette tape

Check procedure:

- (1) Put the machine into the PLAY mode without cassette tape.
- (2) Check that the clearance between the pinch press lever A and B meets the required specification.
- (3) Repeat the unthreading and the threading completion modes (PLAY mode)two or three times and check to meet the required specification.

- (1) Loosen the two mounting screws of the pinch press mechanism block about 1/4 to 1/2 turn.
- (2) Adjust the position of the pinch press mechanism block by the flatblade screw driver, 3mm dia. so that it meets the required specification.



6-6-6. Pinch Press Lever Height Adjustment

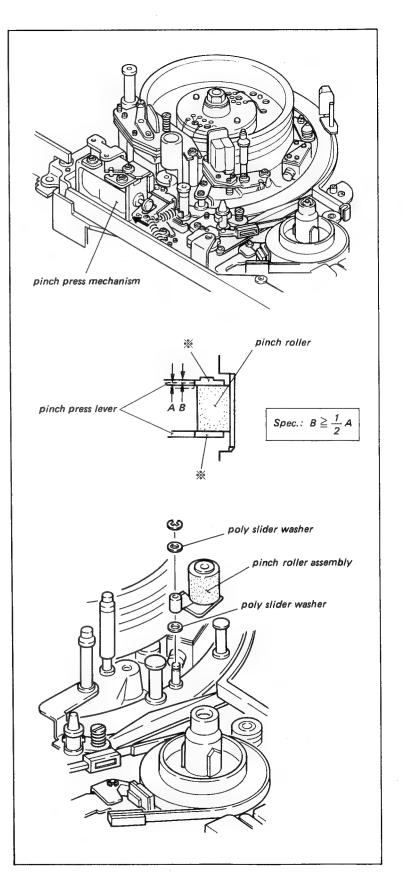
Tool: PB alignment checker

Mode: Threading end Check procedure:

(1) Press the iron core of the pinch solenoid in the direction of the arrow slowly.

Check that the top and bottom plates of the pinch press lever press the * marked portion of the pinch roller. Check that the positional relationship between the lever and the * marked portion of the pinch roller meets therequired specification.

- (1) Replace the poly-slider washer under the pinch roller ass'y so that it meets the required specification.
- (2) After replacement, check the vertical play of the pinch roller as sec. 5 so that it meets the required specification.



6-7. T COIL SENSOR POSITION ADJUSTMENT

Tool: PB alignment checker

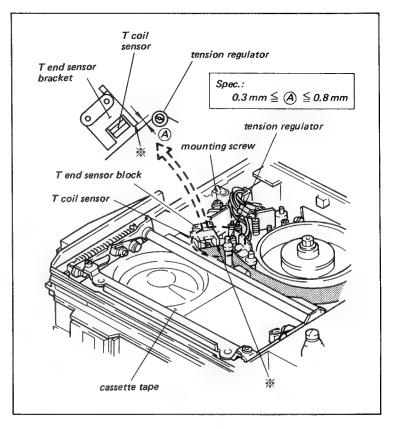
Cassette tape without lid

Mode: PLAY
Check procedure:

- (1) Insert the cassette tape (use the beginning portion of the tape) and into the playback mode.
- (2) Check that the clearance between the tape and the * marked portion of the T coil sensor meets the required specification.

Adjustment procedure:

(1) Adjust the position of the T end sensor bracket so that it meets the required specification.

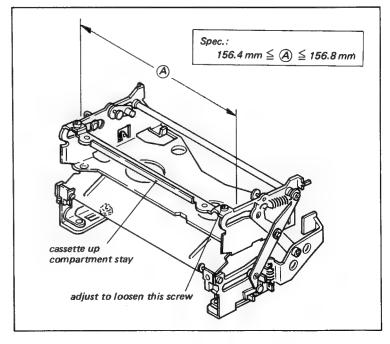


6-8. CASSETTE UP COMPARTMENT STAY MOUNTING POSITION ADJUSTMENT

.This adjustment is usually not required. Proceed with the following step only when the cassette up compartment stay is replaced or removed.

Tool: Slide vernier caliper or equivalent

- (1) Tighten the left side screw of the stay.
- (2) Tighten the right side screw of the stay so that meets the required specification.



SECTION 7 TORQUE AND BACK TENSION ALIGNMENT

ALIGNMENT INFORMATION

MODE

. Unthreading end mode

It means EJECT completion mode.

The threading guide, tension regulator arm and threading ring are put back at the cassette tape side completely.

. Threading end mode

- (1) Connect the Head Amp. block of PB alignment checker to VTR.
- (2) Turn the SAVE/STNADBY switch of checker into STANDBY.
- (3) Keep pushing the cassett in shaft till the threading ring rotation is stopped.

This state means the threading end mode.

. Threading mode

- (1) Connect the Head Amp. block of the PB alignment checker to VTR.
- (2) Turn the SAVE/STANDBY switch of checker into STANDBY.
- (3) Push the cassette in shaft and rotate the threading ring. Threading mode means that this threading ring is rotating.

. PLAY mode without cassette tape

- (1) Connect the Head Amp. block of the PB alignment checker to VTR.
- (2) Turn the SAVE/STANDBY switch of checker into STANDBY.
- (3) Keep pressing the cassette in shaft till the threading ring rotation is stopped.
- (4) Turn the START/STOP switch of checker into START. This state means the PLAY mode without cassette tape.

. PLAY mode

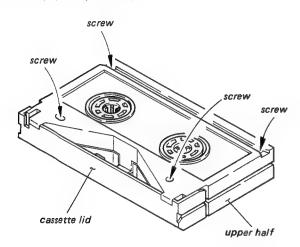
- (1) Connect the Head Amp. block of the PB alignment tape to VTR.
- (2) Insert a cassette tape into VTR.
- (3) Turn the SAVE/STANDBY switch of checker into STANDBY. (Threading starts)
- (4) Turn the START/STOP switch of checker into START. This state means the PLAY mode.

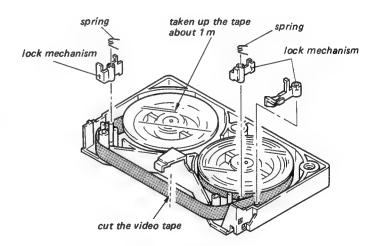
HOW TO MAKE THE LOCALLY-SPECIALLY-MADE-TAPE

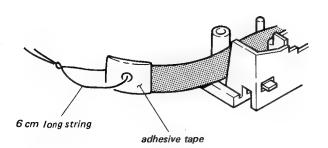
This tape is used for the FWD back tension adjustment. Prepare this tape as follows:

- (1) Wind the L-500 cassette tape to the tape beginning portion.
- (2) Remove the four screws on back of the cassette tape, and remove the upper half of the cassette.
- (3) Remove the lock mechanism parts and the springs on the left and right.
- (4) Remove the cassette lid from the upper half.
- (5) Taken up the video tape on the take-up reel about 1 meter. Cut the video tape at the position as shown in figure. Remove the take-up reel from the cassette. (The take-up reel is used for torque measurement as a locally-specially-made-reel.)
- (6) Attach an adhesive tape on an end of the tape at the supply side and make a hole on the adhesive tape.
- (7) Make a loop of 6cm long string through the hole.
- (8) Install the upper half on the lower half with four screws from the back side.

< locally-specially-made-tape >



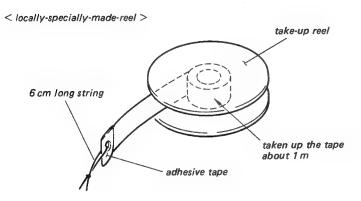




HOW TO MAKE THE LOCALLY-SPECIALLY-MADE-REEL

This is used for the torque measurement. This reel is the take-up reel that is removed in "locally-specially-made-tape".

- (1) Remove the take-up reel referring the step (5) "How to make the locally-specially-made-tape".
- (2) Attach an adhesive tape on an end of the tape at the take-up side and make a hole on the adhesive tape.
- (3) Make a loop of 6cm long string through the hole.



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7-1. S SOFT BRAKE TORQUE ADJUSTMENT

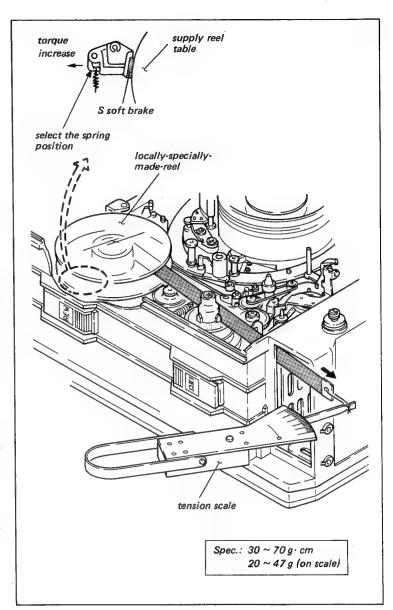
Tool: Locally-specially-made-reel
(Refer to alignment information.)
Tension scale (50g full scale)

Mode: Unthreading end

Check procedure:

- (1) Wind the tape of the locally-speciallymade-reel to the clockwise direction.
- (2) Open the lid of the battery case. If battery is in the case, remove it.
- (3) Install the locally-specially-made-reel on the supply reel table and thread the tape through between the battery case and the cabinet.
- (4) Hook a tension scale on an end of the tape.
- (5) Pull out the tape at the constant speed of approx. 12cm/sec. in the direction of the arrow. Check that the scale reading meets the required specification.

- (1) Clean the matching surface of the S soft brake on the supply reel table with a cloth moistened with cleaning fluid.
- (2) Select the spring position of the S soft brake so that meets the required specification.



7-2. T SOFT BRAKE TORQUE ADJUSTMENT

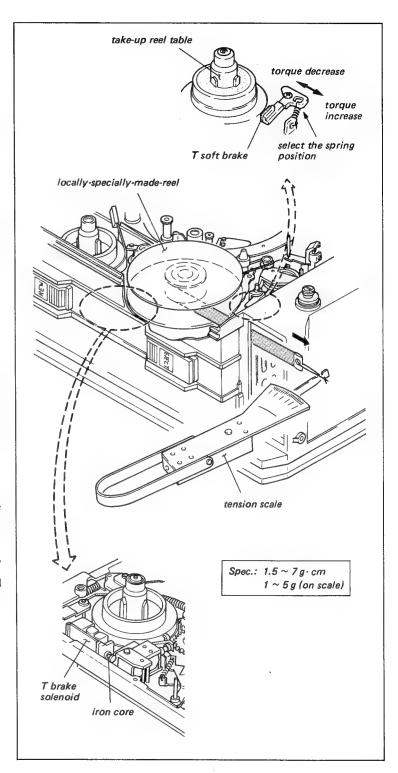
Tool: Loccally-specially-made-reel
(Refer to alignment information.)
Tension scale (20g full scale)

Mode: Unthreading end

Check procedure:

- (1) Wind the tape of the locally-speciallymade-reel to the counterclockwise direction.
- (2) Open the lid of the battery case. If battery is in the case, remove it.
- (3) Install the locally-specially-made-reel on the take-up reel table. Thread the tape through between the battery case and the cabinet as shown in figure.
- (4) Hook a tension scale on an end of the tape.
- (5) While pushing the iron core of the T brake solenoid into the energized position with finger, pull out the the tension scale at the constant speed of approx. 12cm/sec. in the direction of the arrow. Check that the scale reading meets the required specification.

- (1) Clean the matching surface of the T soft brake on the take-up reel table with a cloth moistened with cleaning fluid.
- (2) Select the spring position of the T soft brake so that meets the required specification.



7-3. T MAIN BRAKE TORQUE ADJUSTMENT

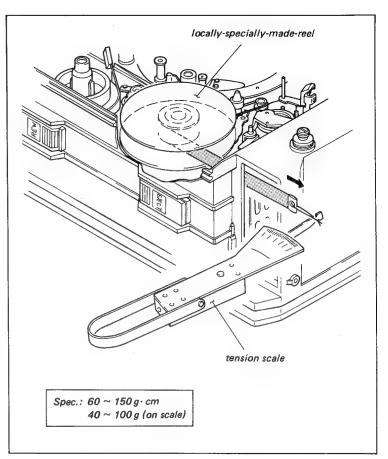
Tool: Locally-specially-made-reel (Refer to alignment information.) Tension scale (200g full scale)

Mode: Unthreading end

Check procedure:

- (1) Wind the tape of the locally-speciallymade-reel to the counterclockwise direction.
- (2) Open the lid of the battery case. If battery is in the case, remove it.
- (3) Install the locally-specially-made-reel on the take-up reel table and thread the tape through between the battery case and the cabinet.
- (4) Hook a tension scale on an end of the tape.
- (5) Pull out the tension scale at the constant speed of approx. 12cm/sec. in the direction of the arrow. Check that the scale reading meets the required specification.

- (1) Clean the matching surface of the T main brake on the take-up reel table with a cloth moistened with cleaning fluid.
- (2) Perform the check procedure: If does not meet the specification, replace the brake.
- (3) After replacement, check again.



7-4. FWD BACK TENSION ADJUSTMENT

Mode: Threading end

Tool and equipment:

Tension scale

Locally-specially-made-tape

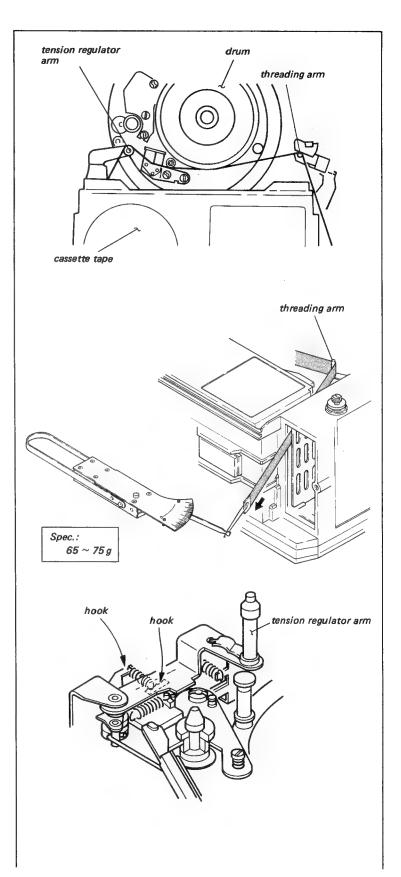
(Refer to alignment information.)

Check procedure:

- (1) Install the locally-specially-made-tape on the set in the threading end mode.
- (2) Open the lid of the battery case. If battery is in the case, remove it.
- (3) Thread the tape as shown in figure. Thread an end of the tape through between the battery case and the cabinet as shown in figure.
- (4) Hook the tension scale on an end of the tape.
- (5) Push the iron core of the pinch solenoid into the energized position with finger. (Don't remove finger.)
- (6) In the energized position, pull out the tension scale at a constant speed of approx. 12cm/sec. and confirm that the scale reading is in the specification.

Adjustment procedure:

(1) Select the proper spring hook to meet the specification.



7-5. FWD TORQUE MEASUREMENT

Tool: PB alignment checker

Locally-specially-made-reel

(Refer to alignment information.)

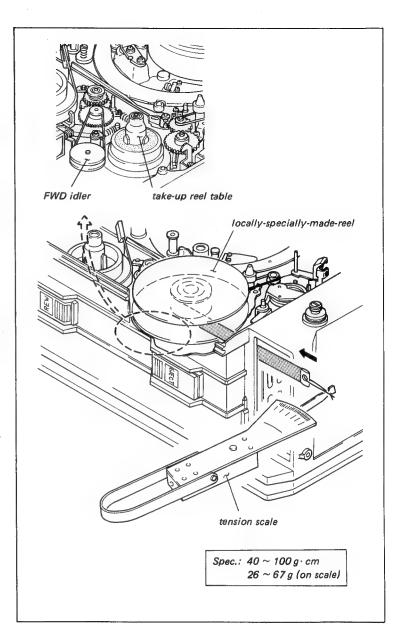
Tension scale (100g full scale)

Mode: Playback

Check procedure:

- (1) Open the lid of the battery case. If battery is in the case, remove it.
- (2) Install the locally-specially-made-reel on the take-up reel table. Thread the tape through between the battery case and the cabinet as shown in figure.
- (3) After the tape is pulled out, hook a tension scale on an end of the tape.
- (4) Put the machine into the PB mode.
- (5) Let the tape be pulled at the constant speed of approx. 12cm/sec. Check that the scale reading meets the required specification.

- (1) Clean the matching surface of the FWD idler on the take-up reel table with a cloth moistened with cleaning fluid.
- (2) Replace the FWD idler.
- (3) After replacement, perform the check procedure.



7-6. EJECT TORQUE MEASUREMENT

Tool: PB alignment checker

Locally-specially-made-reel

(Refer to alignment information.)

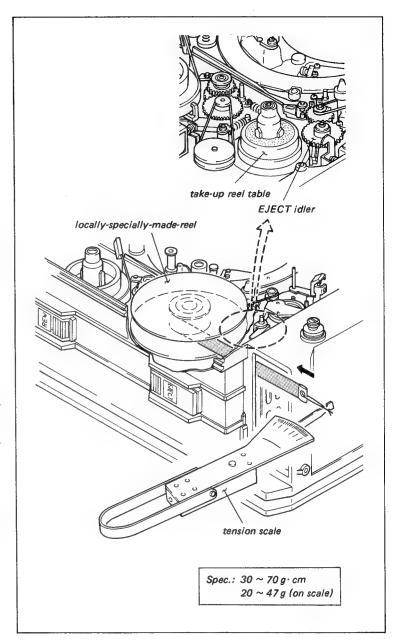
Tension scale(50g full scale)

Mode: EJECT (measure during the unthreading mode.)

Check procedure:

- (1) Open the lid of the battery case. If the battery is in the case, remove it.
- (2) Put the machine into the threading end mode.
- (3) Install the locally-specially-made-reel on the take-up reel table. Thread the tape through between the battery case and the cabinet.
- (4) After the tape is pulled out, hook a tension scale on an end of the tape.
- (5) Turn the SAVE/STANDBY switch into SAVE (into the unthreading mode.)
- (6) Let the tape be pulled at the constant speed of approx. 12cm/sec. in the unthreading mode. Check that the scale reading meets the required specification.

- (1) Replace the EJECT idler.
- (2) After replacement, perform the check procedure.



7-7. REW TORQUE MEASUREMENT

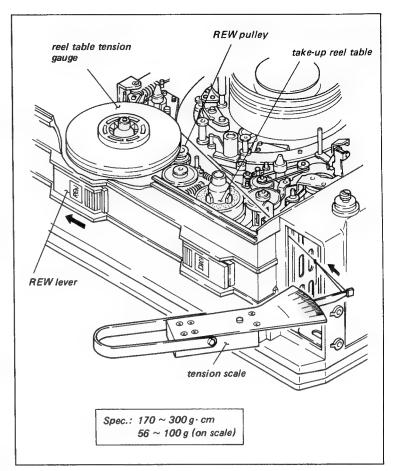
Tool: PB alignment checker
Reel table tension gauge
Tension scale (100g full scale)

Mode: REW

Check procedure:

- (1) Short between TP101 and REG 5V line on SS-23 board, and short between TP106 and TP103 with short clip leads.
- (2) Open the battery case. If the battery is in the case, remove it.
- (3) Install the reel table tension gauge on the supply reel table. Thread the string through between the battery case and the cabinet.
- (4) After the string is pulled out, hook a tension scale on an end of the string.
- (5) Put the machine into the REW mode while pressing the REW lever.
- (6) Let the string be pulled. Check that the scale reading meets the required specification.

- Remove the supply reel table and loosen the mounting screw of the REW adjusting plate.
- (2) Replace the REW pulley.
- (3) Perform the sec. 6-2-3 REW adjusting plate position adjustment.
- (4) After replacement, perform the check procedure.



SECTION 8 TAPE RUN ALIGNMENT

ALIGNMENT INFORMATION

ALIGNMENT TAPE

. Alignment tape for tracking adjustment

There are two types alignment tape for tracking adjustment.

- (1) Tracking tape for recorder, CR2-3
- (2) Tracking tape for player, CR2-1

CR2-3 (8-960-097-03)

Contents	For use
Video, Y track ;4MHz signal (track width;90µ) C track ;blank	.Video tracking adjustment for recorder .CTL head position adjustment for
Audio, blank TC, CTL signal	recorder .TC head position adjustment for recorder

CR2-1 (8-960-097-02)

Contents	For use
Video,Y track;4MHz signal (track width; 73µ) C track;5MHz signal (track width; 73µ) Audio,blank TC, CTL signal	.Video tracking adjustment for player .CTL head position adjustment for player .TC head position adjustment for play- er .Switching position adjustment for player and recorder

. Alignment tape for general adjustment

CR5-1 (8-960-097-22)

Contents	For use
Video,color-bar signal	.Video, Audio, Servo and
TC, SMPTE time code signal	Time Code system adjustments
Video,gated sweep signal Audio,1KHz signal	.Video and Audio adjustments
Video,2T pulse/2T bar signal	.Video adjustment
Audio,10KHz signal	.Audio head position adjustment
Video, monoscope signal	.Video head dihedral adjustment
(switching position is shfted)	.Audio frequency response adjust
Audio,1KHz,7KHz,10KHz,15KHz signals	ment
Video, blank	.CTL head height adjustment
Audio,blank	
CTL, audio 1KHz signal	

MODE

. Unthreading end mode

It means EJECT completion mode.

The threading guide, tension regulator arm and threading ring are put back at the cassette tape side completely.

. Threading end mode

- (1) Connect the Head Amp. block of PB alignment checker to VTR.
- (2) Turn the SAVE/STNADBY switch of checker into STANDBY.
- (3) Keep pushing the cassett in shaft till the threading ring rotation is stopped.

This state means the threading end mode.

. Threading mode

- (1) Connect the Head Amp. block of the PB alignment checker to VTR.
- (2) Turn the SAVE/STANDBY switch of checker into STANDBY.
- (3) Push the cassette in shaft and rotate the threading ring. Threading mode means that this threading ring is rotating.

. PLAY mode without cassette tape

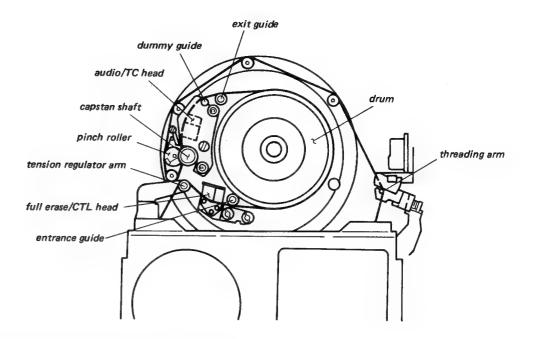
- (1) Connect the Head Amp. block of the PB alignment checker to VTR.
- (2) Turn the SAVE/STANDBY switch of checker into STANDBY.
- (3) Keep pressing the cassette in shaft till the threading ring rotation is stopped.
- (4) Turn the START/STOP switch of checker into START. This state means the PLAY mode without cassette tape.

. PLAY mode

- (1) Connect the Head Amp. block of the PB alignment tape to VTR.
- (2) Insert a cassette tape into VTR.
- (3) Turn the SAVE/STANDBY switch of checker into STANDBY. (Threading starts)
- (4) Turn the START/STOP switch of checker into START. This state means the PLAY mode.

THE LOCATION OF HEADS AND TAPE GUIDES

The heads and tape guides are located as follows.

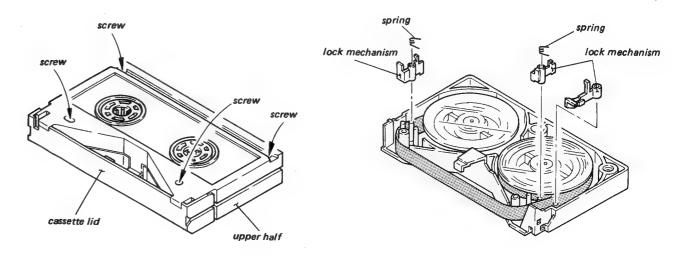


HOW TO MAKE THE CASSETTE TAPE WITHOUT LID

Since the VTR is designed compact size, the check and adjustment can not be performed if cassette tape lid is installed.

The cassette tape lid removal procedures are as follows:

- (1) Remove the four screws on the back of the cassette as shown in figure, and remove the upper half of the cassette.
- (2) Remove the lock mechanism parts and the springs on the left and right.
- (3) Remove the cassette lid from the upper half.
- (4) Install the upper half on the lower half with four screws from the back side.



HOW TO MAKE THE ALIGNMENT TAPE WITHOUT LID

Since the VTR is designed compact size, the check and adjustment can not be performed if the alignment tape lid is installed.

Remove the lids of the alignment tape CR2-1 and CR2-3 for the tracking adjustment referring "How to make the cassette tape without lid".

HOW TO TURN THE VTR INTO RECORD AND REW MODES WITHOUT CAMERA

When the VTR is turned into record and REW modes without camera, record mode is performed as the following steps.

- (1) Connect the VA-1V to the VTR.
- (2) Connect the composite video signal to the VA-1V.
- (3) Insert a cassette tape to VTR (the tape is threaded automatically).
- (4) Press the REC button (record is started)
- (5) Re-press the REC button (record is stopped)
- (6) Press the EJECT button (the tape is unthreaded and then into EJECT mode).

When the VA-1V is connected to the VTR, REW mode is performed as the following steps.

- (1) Disconnect the composite video signal from the VA- 1V.
- (2) Press the REW button in the direction of the arrow.

(Note)

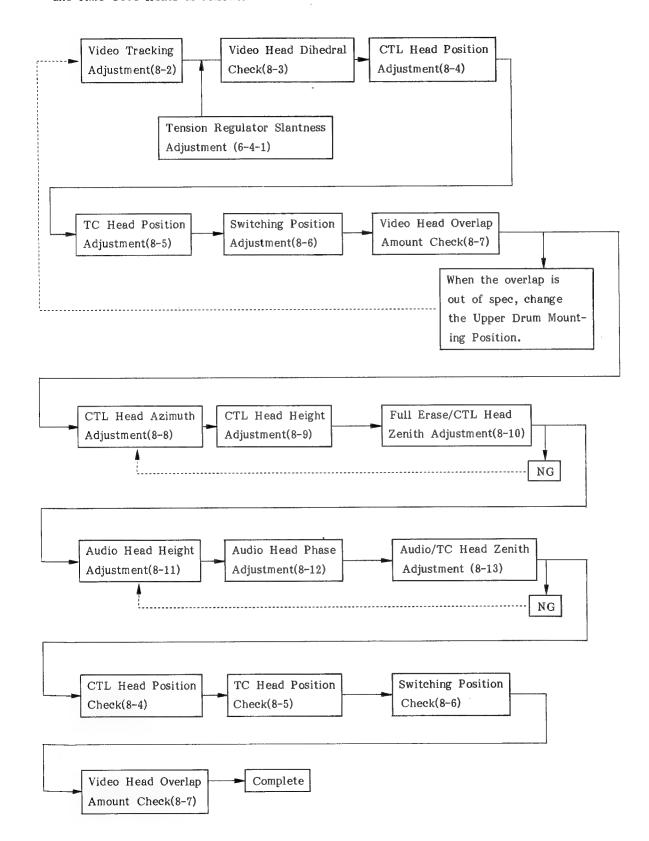
When the video signal is connected to the VA-1V in the REW mode, REW mode is stopped and VTR is put into the threading mode automatically.

CAUTION FOR THE TRACKING ADJUSTMENT

Connect the PB alignment checker to the VTR when the tracking adjustments of Video, Audio, CTL and Time Code Heads are performed. When the PB alignment checker is connected to the VTR, the VA-16 board can not be closed. Therefore, remove the VA-16 board once when the tracking adjustments are performed with PB alignment checker. Remove the CN109/SS-23 board and insert the dummy board that is supplied with the PB alignment checker. (The power does not function if the dummy board is not connected.) When the tracking check of Video, Audio, CTL and Time Code Heads are performed, it is not neccessary to remove the VA-16 board from the VTR.

ADJUSTMENT STEPS OF TRACKING ADJUSTMENT

Perform the tracking adjustment of Video, Audio, CTL and Time Code Heads as follows:



8-1. TAPE RUN ADJUSTMENT

8-1-1. Tape Run Adjustment Around Pinch Roller

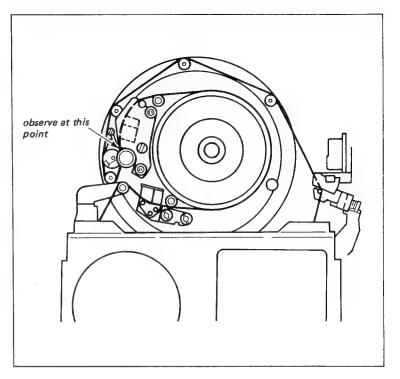
Mode: Playback

Tool: PB alignment checker

Check procedure:

- (1) Insert a cassette tape and put the machine into the playback mode. (Never use the alignment tape.)
- (2) Observe the surface of the running tape between the audio head and the capstan very carefully. Check that the tape tension is exactly equal at the tape top and the tape bottom.
- (3) Turn the VTR START/STOP switch of the alignment checker into STOP mode. (PAUSE mode.)
- (4) Turn the VTR START/STOP switch into START. Check that the tape tension is exactly equal at the tape top and the tape bottom.
- (5) Confirm to repeat the steps (3) and (4).

- (1) Perform the sec. 8-13 Audio/TC head zenith adjustment.
- (2) If the specification cannot be met by step (1), replace the pinch roller block. Perform the sec.6-5-3 Thread end position adjustment.



8-1-2. Tape Run Adjustment (T Drawer Guide Slantness Adjustment)

Mode: Playback

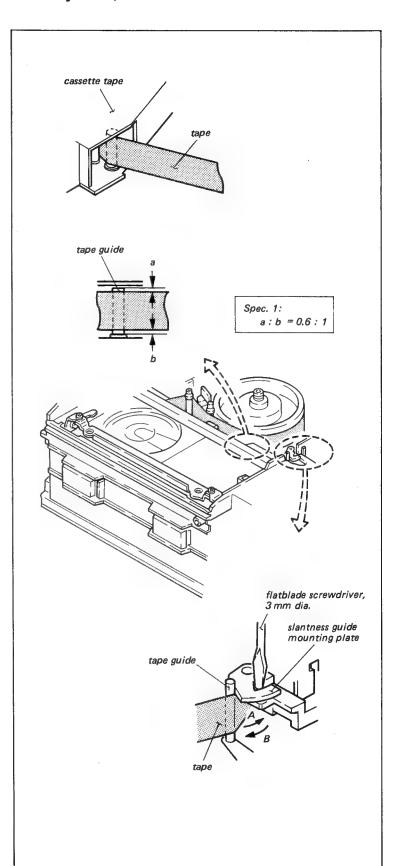
Tool: PB alignment checker

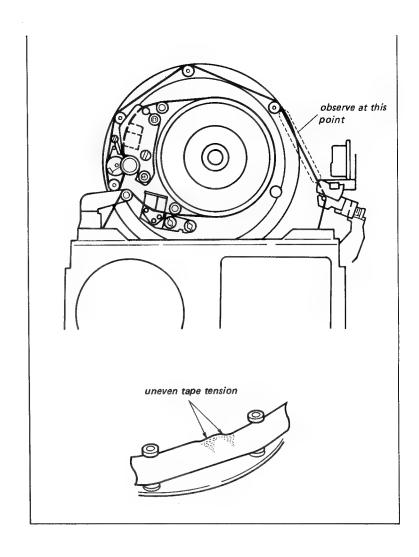
Cassette tape without lid

Check procedure:

- (1) Insert a cassette tape and put the machine into playback mode (never use the alignment tape).
- (2) Check that the positional relationship between the tape and the tape guide at the take-up side of the cassette tape as shown in figure. (Spec. (1))
- (3) Turn the VTR START/STOP switch of the alignment checker into STOP mode (PAUSE mode).
- (4) Turn the VTR START/STOP switch into START again. Observe the surface of the running tape very carefully. Check that the tape tension is exactly equal at the tape top and tape bottom (Spec (2)).
- (5) Confirm to repeat at steps (3) and (4) four or five times. If the specification is met (1), a little amount of uneven tape tension at tape top or tape bottom is acceptable.

- (1) Adjust the position of the slantness guide mounting plate so that meets the required specifications (1) and (2).
- .When the tape runs at the upper portion of the tape guide, move the slantness guide mounting plate to the A direction by hand.
- When the tape runs at the lower portion of the tape guide, move the slantess guide mounting plate to the B direction by flatblade screwdriver, 3mm dia.





8-2. VIDEO TRACKING ADJUSTMENT

Tool: PB alignment checker
Alignment tape, CR2-3
Oscilloscope
Allen wrench (each edge has 1.5mm)
Inspection mirror

Mode: Playback the alignment tape

Preparation:

- Connect the PB alignment checker to the VTR. (Refer to Operation Manual of PB alignment checker.)
- (2) Connect the oscilloscope to the video RF OUT terminal of checker.
- (3) Tap the bottom surface of the alignment tape on a hard surface lightly two or three times so that the tape is positioned to the lower side in the reel hub of the cassette tape. (For stable video tracking adjustment)
- (4) Insert the alignment tape and turn the SAVE/STANDBY switch of checker into STANDBY.

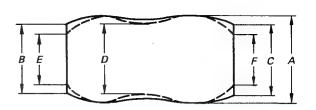
Check procedure:

- (1) Turn the RF CH SELECT switch of the alignment checker to A-B position.
- (2) Turn the CH BAL knob of the alignment checker so that the RF envelopes of CH-A and CH-B are equal level.
- (3) Turn the TRACKING knob of the alignment checker in the clockwise and counterclockwise directions. Noting that the RF envelope maintains a flat envelope while amplitude increases and decreases.
- (4) Disconnect the clips at TP13 and TP14 on SS-23 board. Check that the RF envelope fluctuation and head-to-tape contact are within the specifications.

Adjustment procedure:

When the tracking at the drum entrance side is no good.

(1) Perform the check procedures (1) to (3) so that the RF envelope amplitude is made to 70 to 80% of the maximum amplitude.



Spec.:

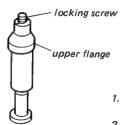
head-to-tape contact

$$\frac{B}{A} \ge 0.7$$
 $\frac{C}{A} \ge 0.7$

fluctuation

$$\frac{D}{A} \ge 0.9 \quad \frac{E}{B} \ge 0.9 \quad \frac{F}{C} \ge 0.9$$

< tape guide >

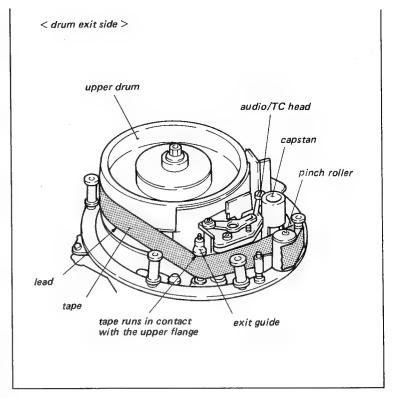


- 1. Loosen the locking screw about 2 to 3 turns.
- 2. Turn the upper flange of the tape guide.

< drum entrance side >

tape tape runs in contact with the upper flange

- (2) Loosen the locking screw of the entrance guide. Turn the flange of the tape guide so that the tape does not contact with the flange.
- (3) Perform the following steps so that the tape runs in contact with the upper flange of the tension regulator and RF envelope is flat simultaneously.
 - i. Adjust the height of the roller guide of the tension regulator. Check that the tape runs without curl at the upper flange with the inspection mirror.
 - (Acceptable range of the tape curl at the upper flange is less than 1/10 of the tape width.)
 - ii. Contact the upper flange of the en trance guide with the tape. Check that the tape runs without curl at the upper flange with the inspection mirror. (Acceptable range of the tape curl at the upper flange is less than 1/10 of the tape width.)
 - iii. Repeat the steps i and ii.
- .When the tracking at the drum exit side is no good.
- (4) Perform the check procedures (1) to (3) so that the RF envelope amplitude is made to 70 to 80% of the maximum amplitude.
- (5) Adjust the height of exit guide so that the tape runs in contact with the lead of the drum and RF envelope is flat simultaneously.
 - Check that the tape runs without curl at the upper flange with the inspection mirror. (Acceptable range of the tape curl at the upper flange is less than 1/10 of the tape width.)
- (6) Confirm the check procedures (1) to (4).



8-3. VIDEO HEAD DIHEDRAL ADJUSTMENT

.This adjustment is performed only for the Y head.

.The reference head is CH-A.

Tool: PB alignment checker

Alignment tape, CR5-1

Monitor TV

Dihedral adjusting screw (four pieces)

Mode: Playback the alignment tape

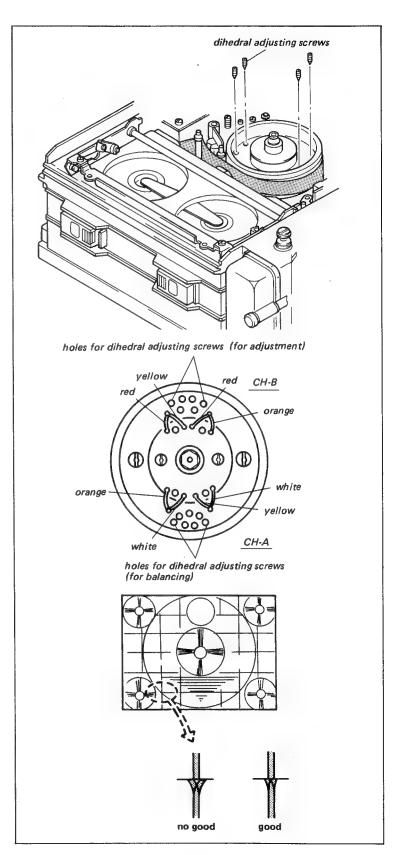
Preparation:

- Connect the PB alignment checker to the VTR. (Refer to Operation Manual of PB alignment checker.
- (2) Connect the monitor TV to the checker.
- (3) Insert the alignment tape and turn the SAVE/STANDBY switch of checker into STANDBY.
- (4) Turn the VTR START/STOP switch of checker into START and playback the monoscope segment of the alignment tape. (for dihedral adjustment)

Check procedure:

(1) Check the vertical line beneath the switching point visually on a monitor. If the vertical line does not split into two lines, no adjustment is necessary.

- (1) Screw lightly four dihedral adjusting screws into the upper drum.
- (2) Turn the adjusting screw adjacent to the Y head with red/yellow leads until some resistance is felt.
- (3) If this screw is turned further, the video head is moved and the dihedral is adjusted. Therefore, turn this screw an additional quarter turn.
- (4) Check for dihedral distortion. If the distortion has gotton worse, turn this screw back one turn and tighten the other screw (red/orange leads side) a quarter turn. Check again for dihedral distortion and continue in this way until dihedral error is eliminated.
- (5) When the adjustment is completed, remove the four dihedral adjusting screws. After removal, playback the



alignment tape and check dihedral again as error sometimes reappears after screws are removed.

8-4. CTL HEAD POSITION ADJUSTMENT

Tool: PB alignment checker
Alignment tape, CR2-3
Oscilloscope

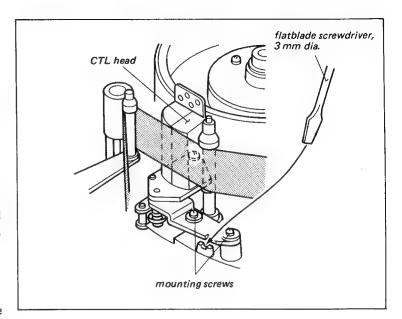
Preparation:

- Connect the PB alignment checker to the VTR. (Refer to Operation Manual of PB alignment checker.)
- (2) Connect the oscilloscope to the RF output terminal of the checker.
- (3) Connect the clips for tracking control to TP13 and TP14 on SS-23 board, and connect the clip for switching pulse to TP5 on SS-23 board.
- (4) Short between TP2, TP3 and GND on SS-23 board with short clip leads.
- (5) Insert the alignment tape and turn the SAVE/STANDBY switch of checker to STANDBY.
- (6) Turn the VTR START/STOP switch of the checker into START and playback the alignment tape.

Check procedure:

- Turn the TRACKING knob so that the RF envelope is made as large as possible.
- (2) Disconnect the clips from TP13 and TP14 on SS-23 board.
- (3) Check that the RF envelope is the same level as step (1).

- Disconnect the clips from TP13 and TP14 on SS-23 board.
- (2) Loosen the two mounting screws about 1/2 to 1/4 turn. Insert the flatblade screwdriver, 3mm dia. in the notch of the head mounting plate and adjust the maximum output at the center of the waveform.



8-5. TC HEAD POSITION ADJUSTMENT

.It is required that the sec.8-4 CTL head position adjustment is checked to be correct or properly adjusted before initiating this adjustment.

Tool: PB alignment checker

Alignment tape, CR2-3

Dual trace oscilloscope

Eccentricity driver (4 mm dia.)

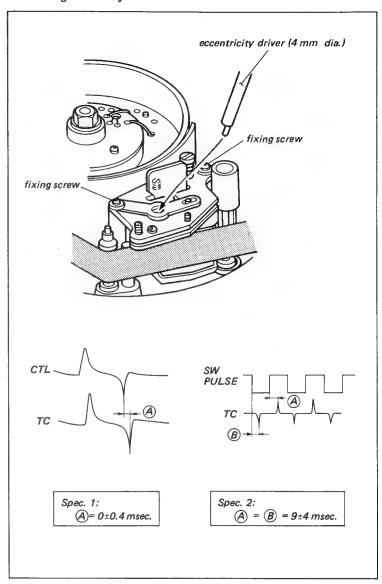
Preparation:

- (1) Connect the PB alignment checker to the VTR. (Refer to Operation Manual of PB alignment checker.)
- (2) Disconnect the clips for tracking control from TP13 and TP14 on SS-23 board and connect the clip for switching pulse to TP5 on SS-23 board.
- (3) Connect the oscilloscope to the TC output and CTL output terminals of checker.
- (4) Insert the alignment tape and turn the SAVE/STANDBY switch of checker into STANDBY.
- (5) Turn the VTR START/STOP switch of checker into START and playback the alignment tape.

Check procedure:

- Check that the waveform meets the required specification(1).
- (2) Connect the oscilloscope to the TC output and SW PULSE output terminals of checker.
- (3) Check that the waveform meets the required specification (2).

- (1) Loosen the fixing screws.
- (2) Adjust the position of TC head with an eccentricity screw driver (4 mm dia.) so that meets the required specification(1).
- (3) Check that the waveform meets the required specification (2) by check procedure steps (2) and (3).
- If the specification in step (2) is not met:
- (4) Adjust the position of the TC head so that it meets the required specification
 (2) by adjusting procedure steps (1) and (2). In this case, the specification (1) is 0 + 6ms.



8-6. SWITCHING POSITION ADJUSTMENT

Tool: PB alignment checker
Alignment tape, CR2-1
Oscilloscope

Mode: Playback the alignment tape

Preparation:

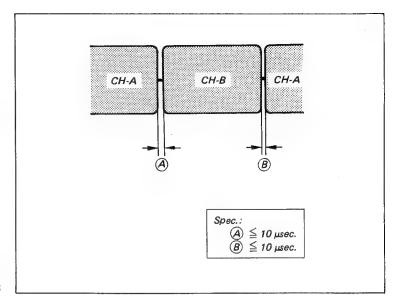
- Connect the PB alignment checker to the VTR. (Refer to Operation Manual of PB alignment checker.)
- (2) Connect the oscilloscope to the RF output terminal of checker.
- (3) Playback the alignment tape.
- (4) Turn the RF CH SELECT switch of the checker to A-B position.
- (5) Turn the CH BAL knob of the checker so that the RF envelopes of CH-A and CH-B are equal level.

Check procedure:

(1) Check that the CH-A and CH-B RF envelopes meet the specification at the switching pulse position.

Adjustment procedure:

(1) Adjust RV1 and RV4 on SS-23 board meet the required specification.



8-7. VIDEO HEAD OVERLAP AMOUNT CHECK

Tool: PB alignment checker Oscilloscope

BVP-1, BVP-3 or VA-1V

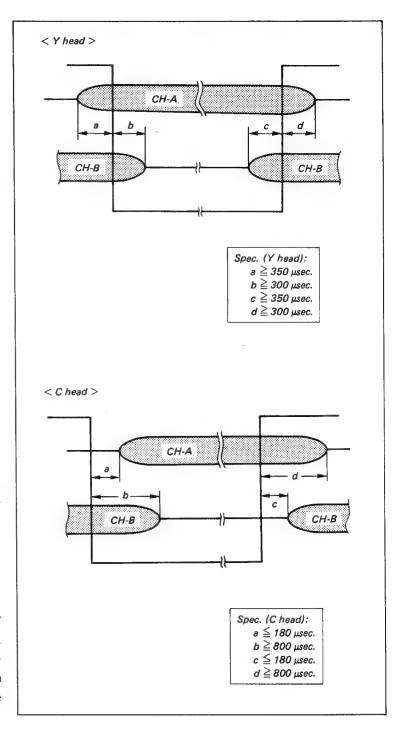
Mode: Self REC/PB

Preparation:

- Connect the BVP-1, BVP-3 or VA-1V to the VTR. Record the video signal about 1 to 2 minutes.
- (2) Open the VA board and disconnect the connectors, CN205 and CN206. Insert CN206 into the video connector of PB alignment checker. Connect the clip for switching pulse to TP5 on SS-23 board.
- (3) Short between TP2, TP3 and GND with short clip leads.
- (4) Connect the oscilloscope to the RF output and the SW PULSE output terminals of checker.
- (5) Playback the self recorded portion in step (1).

Check procedure:

- (1) Check that the overlap of the Y head meets the required specification.
- (2) Disconnect the connector, CN 205 that is connected in video connector of checker.
- (3) Insert CN206 into video connector of checker.
- (4) Playback the self recorded portion in step (1) of Preparation.
- (5) Check that the overlap of the C head meets the required specification.
- (6) If not, loosen the mounting screws of the upper drum. Turn the upper drum in counterclockwise direction while holding the drum pulley by hand. Tighten the mounting screws. Perform the same adjustment steps for the upper drum replacement.



8-8. CTL HEAD AZIMUTH ADJUSTMENT

Tool: Cassette reference plate

Tension regulator slantness check tool

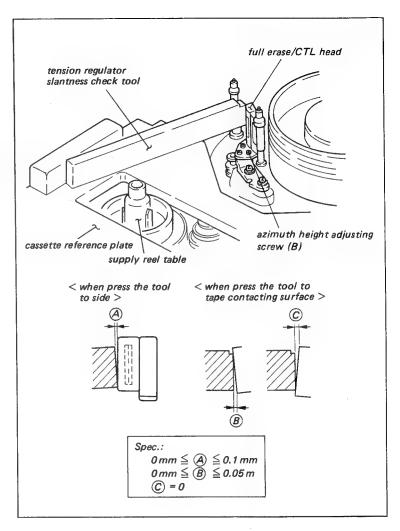
Mode: Any mode

Check procedure:

- (1) Install the cassette reference plate in the cassette position.
- (2) Place the tension regulator slantness check tool at the side of the CTL head as shown in figure. Check that the slantness of the CTL head meets the required specification.

Adjustment procedure:

(1) Adjust the slantness by turning the azimuth height adjusting screw (B).



8-9. CTL HEAD HEIGHT ADJUSTMENT

Tool: PB alignment checker
Alignment tape, CR5-1
Oscilloscope

Preparation:

- Connect the PB alignment checker to the VTR. (Refer to Operation Manual of PB alignment checker.)
- (2) Connect the oscilloscope to the CTL output terminal of checker.
- (3) Insert the alignment tape and turn the SAVE/STANDBY switch of checker to STANDBY.
- (4) Turn the VTR START/STOP switch into START and playback the audio 1kHz signal portion that is recorded on the CTL track of the alignment tape.

Check procedure:

(1) When pressing down the tape at (a) portion, or when pushing up the tape at (b) portion, check that the levels both decrease. If the levels increase, the following adjustments are required.

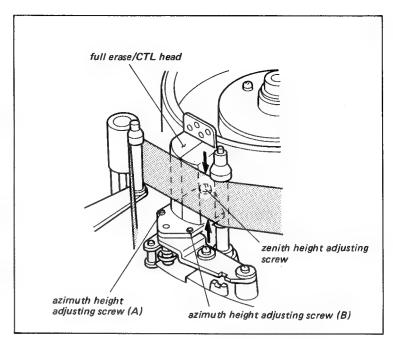
Adjustment procedure:

When the levels increase while pressing down the tape at (a) portion.

(1) Turn the azimuth height adjusting screws
(A) and (B) in the clockwise direction and turn the zenith height adjusting screw an exactly equal amount in the counterclockwise direction. Adjust the maximum output waveform.

When the levels increase while pushing up the tape at (b) portion.

(2) Turn the azimuth height adjusting screws
(A) and (B) in the counterclockwise direction and turn the zenigh height adjusting screw an exactly equal amount in the clockwise direction. Adjust the maximum output waveform.



8-10. FULL ERASE/CTL HEAD ZENITH ADJUSTMENT

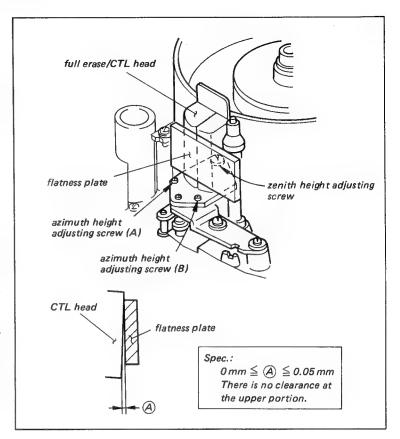
Tool: Flatness plate
Mode: Any mode
Check procedure:

(1) Check that the clearance between the head and the flatness plate meets the required specification, when the flatness plate is set on the tape guide and the full erase/CTL head.

Adjustment procedure:

If there is a clearance at the bottom portion.

- Turn the zenith height adjusting screw in the clockwise direction or turn the azimuth height adjusting screws (A) and (B) exactly equal amounts in counterclockwise direction.
- If there is a clearance at the top portion.
- (2) Turn the zenith height adjusting screw in the counterclockwise direction or the azimuth height adjusting screws(A) and (B) exactly equal amounts in the clockwise direction.



8-11. AUDIO HEAD HEIGHT ADJUSTMENT

Tool: PB alignment checker
Alignment tape, CR5-1
Oscilloscope or VTVM

Preparation:

- Connect the PB alignment checker to the VTR. (Refer to Operation Manual of PB alignment checker.)
- (2) Connect the oscilloscope to the AUDIO CH-1 and CH-2 output terminals of checker.
- (3) Insert the alignment tape and turn the SAVE/STANDBY switch of checker into STANDBY.
- (4) Turn the VTR START/STOP switch of checker into START and playback the audio 1kHz portion of the alignment tape.

Check procedure:

- (1) Check that the output level decreases when pressing down at (a) portion.
- (2) Check that the output level decreases when pushing up at (b) portion.

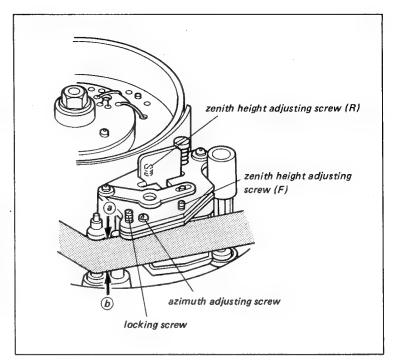
Adjustment procedure:

When the output level increases while pressing down at (a).

- (1) Loosen the locking screw. Adjust the maximum output by turning the zenith height adjusting screws (R) and (F) exactly equal amounts in counterclockwise direction and turn the azimuth adjusting screw of an exactly equal amount in clockwise direction.
- (2) After adjustment, tighten the locking screw and check again.

When the level increases while pushing up at (b).

- (3) Adjust the maximum output by turning the zenith height adjusting screws (R) and (F) exactly equal amounts in clockwise direction and turn the azimuth adjusting screw an exactly equal amount in counterclockwise direction.
- (4) After adjustment, tighten the locking screw and check again.



8-12. AUDIO HEAD PHASE ADJUSTMENT

Tool: PB alignment checker
Alignment tape, CR5-1
Dual trace oscilloscope

Preparation:

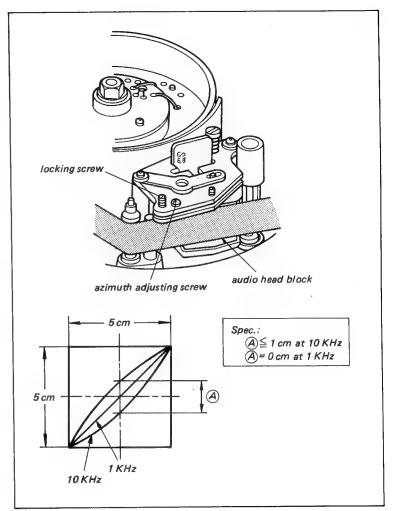
- Connect the PB alignment checker to the VTR. (Refer to Operation Manual of PB alignment checker.)
- (2) Connect the HORIZONTAL and VERTICAL terminals of oscilloscope to the AUDIO OUT CH-1 and CH-2 terminals of checker.
- (3) Insert the alignment tape and turn the SAVE/STANDBY switch of checker into STANDBY.
- (4) Turn the VTR START/STOP switch into START and playback the audio 10kHz portion of the alignment tape.
- (5) Adjust the scope for horizontal and vertical amplitudes of 5cm of a lissajous waveform.

Check procedure:

- (1) Check that the vertical amplitude at the center in the horizontal direction is within the specification.
- (2) Playback the 1kHz portion of the alignment tape and check that the lissajous waveform meets the required specification.

Adjustment procedure:

- (1) Loosen the locking screw about 1/4 to 1/2 turn.
- (2) Adjust the phase by turning the azimuth adjusting screw so that it meets the required specification.
- (3) Tighten the locking screw and check again.



8-13. AUDIO/TC HEAD ZENITH ADJUSTMENT

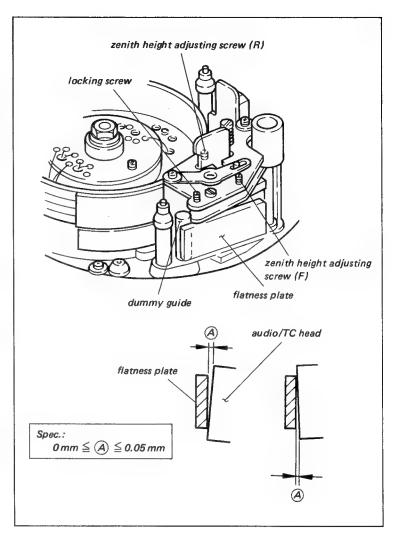
Tool: Flatness plate
Mode: Unthreading end

Check procedure:

(1) Check that the clearance between the head and the dummy guide meets the required specification, when the flatness plate is set on the audio/TC head and the dummy guide.

Adjustment procedure:

- If there is a clearance at the bottom portion.
- (1) Loosen the locking screw about 1/4 to 1 turn.
- (2) Turn the zenith height adjusting screw (R) in the clockwise direction so that meets the required specification.
- (3) Tighten the locking screw and check zenith again.
- If there is a clearance at the top portion.
- (4) Loosen the locking screw about 1/4 to 1 turn,
- (5) Turn the zenith height adjusting screw
 (R) in the counterclockwise direction so that meets the required specification.
- (6) Tighten the locking screw and check again.



8-14. AUDIO CONFI. HEAD TAPE TO HEAD CONTACT ADJUSTMENT

Tool: Audio oscillator Oscilloscope

Preparation:

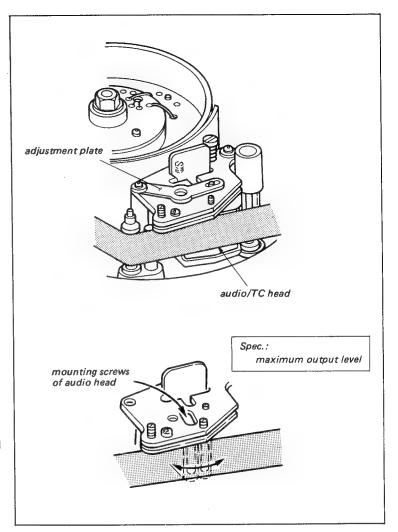
- (1) Turn the METER SELECT switch to AUDIO, AUDIO MANUAL/AUTO switch to MANUAL, AUDIO IN switch to MIC, and CH SELECT switch to CH-1.
- (2) Connect the 1kHz,-60dBm signal and adjust the level by AUDIO LEVEL knob so that the level meter indicates the blue colored position.
- (3) Put the machine into record mode.
- (4) Connect the oscilloscope to the TP702/ VA board.

Check procedure:

(1) Check that the TP702 output meets the required specification.

Adjustment procedure:

- (1) Remove the adjustment plate.
- (2) Loosen the mounting screws of the audio head and adjust the position of the head while turning to the direction of the arrow so that meets the required specification. Check again.



8-15. COMPOSITE SHOOTING ADJUSTMENT

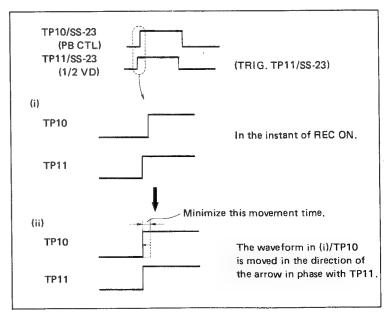
Tool: Dual trace oscilloscope

Preparation:

- Connect the CH-1 of the oscilloscope to TP11/SS-23 board and CH-2 to TP10/SS-23 board.
- (2) Insert & cassette tape to VTR.

Adjustment procedure:

- (1) Adjust the RV102/SS-23 board so that the movement time of the TP10, PB CTL waveform (as shown in (i),(ii)) is minimum in the instant of REC ON.
- (2) Confirm to repeat the REC ON/OFF about 10 times.



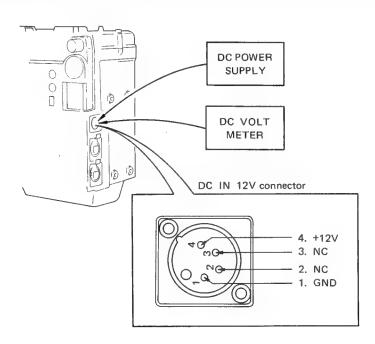
SECTION 9 POWER SUPPLY SYSTEM ALIGNMENT

[Equipment Required]

- Composite Adaptor; VA-1V
- Regulated DC Power Supply
- DC Voltmeter

[Connection]

The BVV-1 cannot record the video and audio signals without connecting camera. Therefore, in order to put VTR into the REC mode without connecting the camera, it is necessary to use the COMPOSITE ADAPTOR; VA-1V or ALIGNMENT CHECKER; BW-536. Connect the REGULATED DC POWER SUPPLY and the DC VOLTMETER as illustrated.



9-1. BATTERY END LEVEL ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
 Connect the 10 K ohms resistor between TP105 and E101/SS-23. Set the RV101/SS-23 to fully CCW position. DC IN 12V connector; 12.0 Vdc PAUSE mode 	TP105/SS-23 Make sure the level of TP105 is "low" level.	
● DC IN 12V connector; 11.0 ± 0.01 Vdc	TP105/SS-23 Slowly turn the RV101/SS-23 to CW direction and set to the position where level of TP105 is alternated "low" and "high".	⊘ RV101/SS-23

9-2. BATTERY METER CALIBRATION

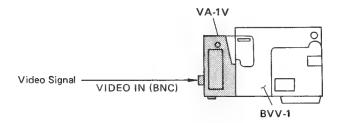
machine conditions for adjustment	spec.	adjustment
Connect the 10 K ohms resistor between TP105 and E101/SS-23.	Level meter	⊘ RV1/CP-49
• DC IN 12V connector; 11.05 ± 0.01 Vdc	2010 5 3 0 3	
REC mode METER SELECT switch;	- BATT VU	
BATT		
	Pointer should be stayed on edge of green zone.	,

SECTION 10 SERVO SYSTEM ALIGNMENT

[Equipment Required]

- Composite Adaptor; VA-1V or Alignment Checker; BW-536
- · Oscilloscope, dual trace

The BVV-1 cannot record the video and audio signals without connecting exclusive camera. Therefore, in order to put VTR into the REC mode without connecting camera, it is necessary to use the COMPOSITE ADAPTOR; VA-1V or ALIGNMENT CHECKER; BW-536.



10-1, CAPSTAN FREE SPEED ADJUSTMENT

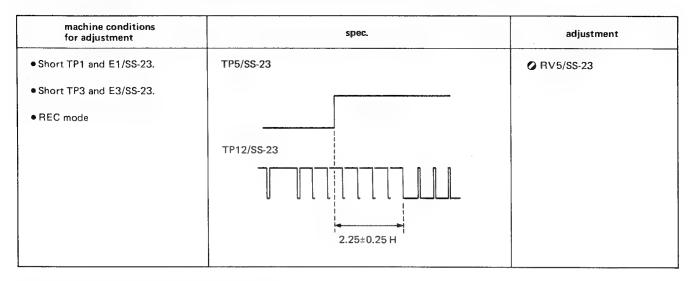
machine conditions for adjustment	spec.	adjustment
REC mode at about the center portion of the tape.	TP4/SS-23	⊘ RV6/SS-23
	В	
	A	
	$duty\left(\frac{B}{A}\right) = 50 \pm 4\%$	

10-2. TRACKING ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
 Playing back the pre-recorded tape at about the center portion of the tape. PB mode; Short TP2 and E2/SS-23 and start the VTR. 	TP-11/SS-23	⊘ RV3/SS-23
	TP10/SS-23 0±0.1 m sec	

10-3. DRUM LOCK PHASE ADJUSTMENT

The sec. 8-6. Switching Position Adjustment should be completed before initiating this adjustment.



10-4. ϕ^2 LOCK PHASE ADJUSTMENT

The sec. 8-6. Switching Position Adjustment should be completed before initiating this adjustment.

machine conditions for adjustment	spec.	adjustment
Short TP1 and E1/SS-23. REC mode	TP3/SS-23 TP12/SS-23 Should be in phase	⊘ RV7/SS-23

SECTION 11 AUDIO SYSTEM ALIGNMENT

[Equipment Required]

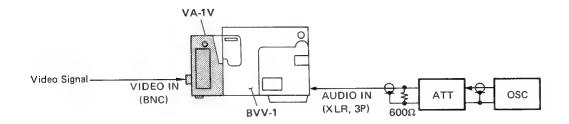
Composite Adaptor; VA-1VAlignment Checker; BW-536

Audio Oscillator

Audio Attenuator

VTVM

[Connection]



The BVV-1 cannot record the video and audio signals without connecting an exclusive camera. Therefore, in order to put VTR into the REC mode without connecting camera, it is necessary to use the COMPOSITE ADAPTOR; VA-1V or ALIGNMENT CHECKER; BW-536.

11-1. AUDIO METER CALIBRATION

machine conditions for adjustment	spec.	adjustment
AUDIO IN CH-1/CH-2 connectors; 1 kHz, —60 dBm	TP503/VA-16 (CH-1) TP603/VA-16 (CH-2) 10 ± 0.2 dB	AUDIO LEVEL controls CH-1 CH-2
 AUDIO IN selectors; MIC AUDIO MANU/AUTO switch; MANUAL 	Level meter	⊘ RV701/VA-16
METER SELECT switch; AUDIO	20 10 5 3 0 3 - BATT +	
AUDIO NR switch (S1/VA-16 board); OFF CH SELECT switch; CH-1	VU /	
●STAND BY mode		
	Pointer should be stayed on '0'	
• Switch over the CH SELECT switch to CH-2.	Level meter Pointer should be stayed on '0'	AUDIO IN CH-2 attenua- tor Attenuate value at this time = 0 ± 0.2 dB

The position of AUDIO LEVEL controls at this adjustment name the "REFERENCE POSITION" in following adjustment procedure.

To set the AUDIO LEVEL controls to "REFERENCE POSITION", apply the 1 kHz, -60 dBm signal to AUDIO IN connectors and adjust the AUDIO LEVEL controls so that level meter points to '0'.

11-2. LIMITER LEVEL ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
AUDIO IN CH-1/CH-2 connectors; 1 kHz, -30 dBm	TP503/VA-16 (CH-1) TP603/VA-16 (CH-2)	RV3/LC-6 (CH-1)RV4/LC-6 (CH-2)
• AUDIO IN selectors; MIC		
AUDIO MANU/AUTO selector; MANUAL	−2 ± 1 dB	
AUDIO NR switch (S1/VA-16 board); OFF		
•STAND BY mode		

11-3. BIAS TRAP ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
AUDIO IN CH-1/CH-2 connectors; No signal	TP501/VA-16 (CH-1) TP601/VA-16 (CH-2)	LV503/VA-16 (CH-1)LV603/VA-16 (CH-2)
• AUDIO IN selector; LINE	Adjust for minimum signal level (i.e. bias leaking)	
Temporarily set the RV503 and		
RV603/VA-16 to fully CCW position.		
• REC mode		

After completing this adjustment, the 11-4. Bias Adjustment and 11-9. Frequency Response Adjustment are required.

11-4. BIAS ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• AUDIO IN CH-1 connector; 1 kHz, -60 dBm	TP701/VA-16	
CH-2 connector; No signal	(1) Turn RV503 to fully CW. Slowly turn RV503 to CCW direction and find its position where the level of TP701 become maximum.	
AUDIO IN CH-1 selector; MIC CH-2 selector; LINE	(2) Slowly turn RV503 to further CCW direction and set to position where spec. is satisfied.	
 AUDIO MANU/AUTO switch; MANUAL 	suitable = maximum level level - 0.5 dB*	
 AUDIO NR switch (S1/VA-16 board); OFF 	·	
• REC mode		
AUDIO IN CH-1 connector; No signal	TP701/VA-16	Ø RV603/VA-16 (CH-2)
CH-2 connector; 1 kHz, —60 dBm	(1) Turn RV603 to fully CW. Slowly turn RV603 to CCW direction and find its position where the level of TP701 become maximum.	
• AUDIO IN CH-1 selector; LINE CH-2 selector; MIC	(2) Slowly turn RV603 to further CCW direction and set to position where spec. is satisfied.	
• AUDIO MANU/AUTO switch; MANUAL	suitable = maximum — 0.5 dB*	
AUDIO NR switch; OFF		
• REC mode		

^{*}Approve of the specification "maximum level $-(0.3 \, dB \text{ to } 0.5 \, dB)$ " only when the 11-9. Frequency Response Adjustment is not met.

11-5. RECORD CURRENT ROUGH ADJUSTMENT

AUDIO LEVEL controls should be set to "REFERENCE POSITION". See the 11-1.

machine conditions for adjustment	spec.	adjustment
AUDIO IN CH-1/CH-2 connectors; 1 kHz, —60 dBm	TP502/VA-16 (CH-1) TP602/VA-16 (CH-2)	RV501/VA-16 (CH-1) RV601/VA-16 (CH-2)
AUDIO IN selectors; MIC	−62 ± 2 dB	
AUDIO MANU/AUTO selector; MANUAL		
AUDIO NR switch (S1/VA-16 board); OFF	·	
• Short TP801 and E801/VA-16		
• REC mode		

11-6. RECORD AMP EQUALIZER ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
 AUDIO IN CH-1/CH-2 connectors; No signal 	TP506/VA-16 (CH-1) TP606/VA-16 (CH-2)	
• AUDIO IN selectors; LINE	Measure the level.	
 Connect the 500±50 Hz, —45 dB signal to TP504 (CH-1) and TP604 (CH-2)/VA-16 board. AUDIO MANU/AUTO selector; MANUAL AUDIO NR switch (S1/VA-16 board); OFF REC mode 		
• Change the input signal that is connected to TP504 and TP604/VA-16. 26 ± 0.2 kHz, -45 dB	TP506/VA-16 (CH-1) TP606/VA-16 (CH-2) (1) Tuning Frequency Adjustment Maximize the level. (2) Tuning Level Adjustment 26 kHz level = 500 Hz level + (12 ± 0.1 dB)	Tuning Frequency LV502/VA-16 (CH-1) LV602/VA-16 (CH-2) Tuning Level RV502/VA-16 (CH-1) RV602/VA-16 (CH-2)

11-7. RECORD CURRENT ADJUSTMENT

AUDIO LEVEL controls should be set to "REFERENCE POSITION". See the 11-1.

machine conditions for adjustment	spec.	adjustment
 AUDIO IN CH-1/CH-2 connectors; 1 kHz, -60 dBm 	OUTPUT terminals CH-1, CH-2/BW-5365.0 ± 0.5 dB	 RV501/VA-16 (CH-1) RV601/VA-16 (CH-2)
• AUDIO IN selectors; MIC	If adjustment is found to be necessary, increase or	Repeat the sequence of record (adjustment) and playback
 AUDIO MANU/AUTO selector; MANUAL 	decrease the Record signal level at TP501 (CH-1) or TP601 (CH-2) by the same signal level as found to be adjusted in the 11-5. Record Current Rough Adjustment procedure.	(level check) until required specification is met.
 AUDIO NR switch (S1/VA-16 board); OFF 		
 Playing back the self-recorded tape with PB ALIGNMENT CHECKER (BW-536). 		

In the event the setting of RV501 or RV601 is changed, the 11-10. Audio Confidence Adjustment is required.

11-8. DOLBY C SPECTRAL SKEWING ADJUSTMENT

machine conditions for adjustment	spec.		adjustment
AUDIO IN CH-1/CH-2 connectors; No signal	TP505/VA-16 (CH-1) TP605/VA-16 (CH-2)		€ LV501/VA-16 (CH-1)€ LV601/VA-16 (CH-2)
• AUDIO IN selectors; LINE	Frequency	Level	
 Connect the 1 kHz, -25 dB/ 17 kHz, -25 dB signals to TP504 (CH-1) and TP604 (CH-2)/VA-16 	1 kHz	refer	
board,	17 kHz refe	r —8.3 dB	
AUDIO MANU/AUTO selector; MANUAL			
 AUDIO NR switch (S1/VA-16 board); ON 			
• STAND BY mode			

11-9. FREQUENCY RESPONSE ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
 AUDIO IN CH-1/CH-2 connectors; 	OUTPUT terminals CH-1, CH2/BW-536	11-4. BIAS ADJUSTMENT
40 Hz, —16 dBm 1 kHz, —16 dBm 7 kHz, —16 dBm	Frequency Level	
10 kHz, —16 dBm 15 kHz, —16 dBm	40 Hz refer ± 3 dB	
• AUDIO IN selectors; LINE	1 kHz refer	
• AUDIO MANU/AUTO selector;	7 kHz refer ± 0.5 dB	
MANUAL	10 kHz refer ± 0.5 dB	
 AUDIO NR switch (S1/VA-16 board); OFF 	15 kHz refer ± 0.5 dB	
 Playing back the self-recorded tape with PB ALIGNMENT CHECKER (BW-536.) 	If spec. is not met, the 11-4. Bias Adjustment is required.	
 Switch over the AUDIO NR switch to ON. 	OUTPUT terminals CH-1, CH-2/BW-536	11-6. RECORD AMP EQUALIZER ADJUSTMENT
	Frequency Level	
	40 Hz refer ± 4 dB	
	1 kHz refer	
	7 kHz refer ± 1 dB	
	10 kHz refer ± 1 dB	
	15 kHz refer ± 1 dB	
	If spec. is not met, the 11-6. Record Amp Equalizer Adjustment is required.	

11-10. AUDIO CONFIDENCE LEVEL ADJUSTMENT

The 11-7. Record Current Adjustment should be completed before initiating this adjustment. AUDIO LEVEL controls should be set to "REFERENCE POSITION". See the 11-1.

machine conditions for adjustment	spec.	adjustment
 AUDIO IN CH-1/CH-2 connectors; 1 kHz, -4 dBm 	TP702/VA-16	Ø RV702/VA-16
• AUDIO IN selectors; LINE	-4.5 ± 2dB	
 AUDIO MANU/AUTO selector; MANUAL 		
 AUDIO NR switch (\$1/VA-16 board); OFF 		
• REC mode		

11-11. INDICATOR AUDIO OUT LEVEL ADJUSTMENT

The purpose of this adjustment is to regulate the output of Audio Level Indicator (VF) when the BVP-3A is connected to 50-pin connector for an exclusive camera. To perform this adjustment, connect the BVP-3A video camera.

AUDIO LEVEL controls should be set to "REFERENCE POSITION". See the 11-1.

Turn the AUDIO LEVEL control on the BVP-3A (VF) to fully MAX direction.

machine conditions for adjustment	spec,	adjustment
 AUDIO IN CH-1 connector; 1 kHz, -60 dBm 	20-pin in the Camera connector (50-pin)	▶ RV5/LC-6
	-15 ± 0.1 dB	
AUDIO IN selector; MIC		
AUDIO MANU/AUTO selector; MANUAL		
 AUDIO NR switch (S1/VA-16 board); OFF 		
• CH SELECT switch; CH-1		
●STAND BY mode		

11-12. ALARM SOUND MIX LEVEL ADJUSTMENT

The volume of both the audio monitor and alarm sound from the speaker or the earphone can be controlled at a same time with the VOLUME control.

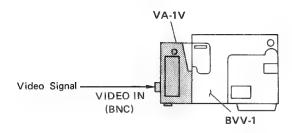
Only the alarm sound volume can be adjusted independently with RV703/VA-16. When the set is shipped, RV703 is set to the maximum output level (fully CCW position).

SECTION 12 VIDEO SYSTEM ALIGNMENT

[Equipment Required]

- Composite Adaptor; VA-1V
- Alignment Checker; BW-536
- DC Voltmeter
- Oscilloscope, dual trace
- Frequency Counter
- Sweep Generator
- NTSC Test Signal Generator
- Spectrum Analizer

[Connection]

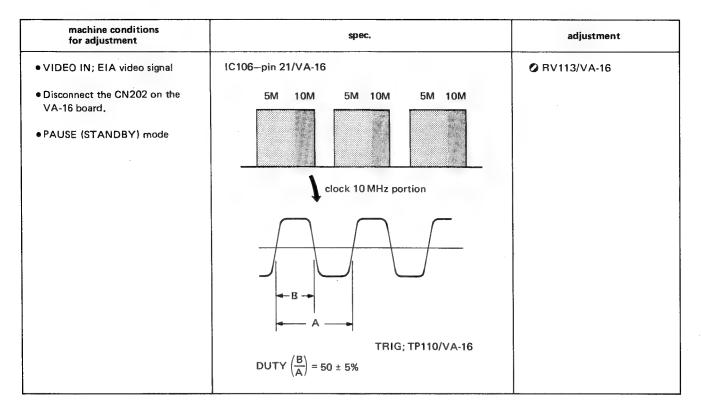


The BVV-1 cannot record the video and audio signals without connecting an exclusive camera. Therefore, in order to put VTR into the REC mode without connecting the camera, it is necessary to use the COMPOSITE ADAPTOR; VA-1V.

12-1. PLL OPERATING POINT ADJUSTMENT

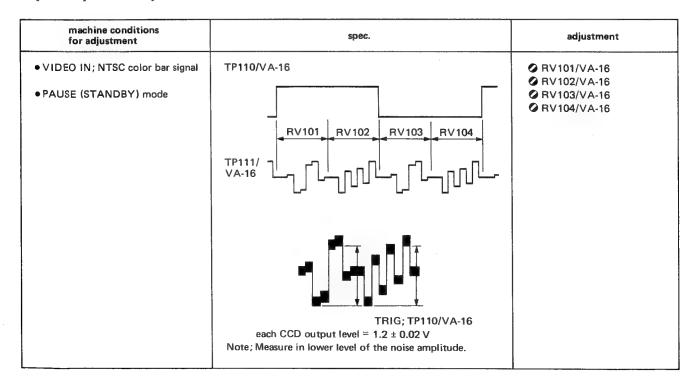
machine conditions for adjustment	spec.	adjustment
◆ VIDEO IN; EIA video signal	TP106/VA-16	⊘ RV111/VA-16
 Disconnect the CN202 on the VA-16 board. 	2.2 ± 0.1 Vde	
PAUSE (STANDBY) mode		

12-2. CCD CLOCK SHAPING ADJUSTMENT

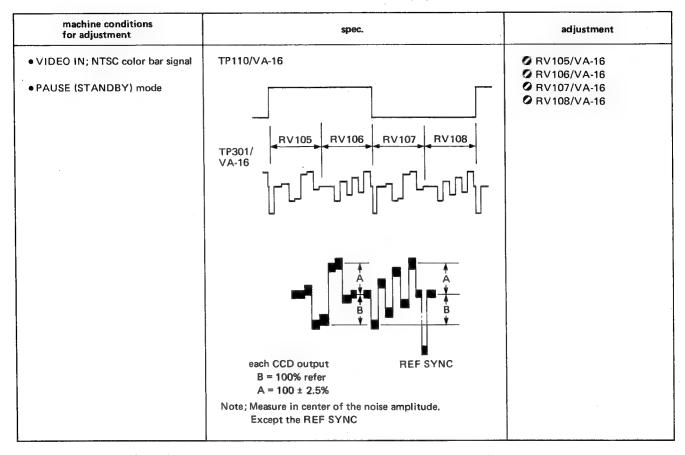


12-3. CCD OUTPUT ADJUSTMENT

Step 1. Output Level Adjustment

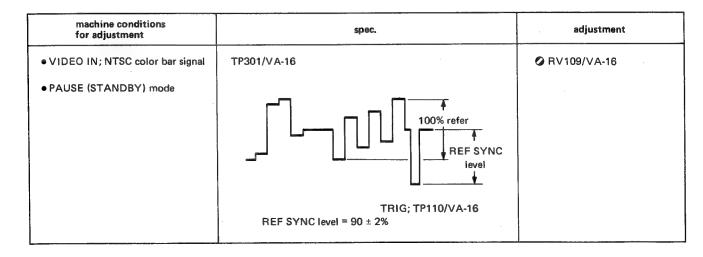


Step 2, Output Linearity Adjustment



Repeat the sequence of step 1 and step 2 until both specifications are satisfied at a same time.

12-4. C REF SYNC LEVEL ADJUSTMENT



12-6. C REF SYNC WIDTH ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
VIDEO IN; NTSC color bar signal	TP301/VA-16	⊘ RV1/PG-3
● PAUSE (STANDBY) mode	2.0±0.05 μsec	

12-7. Y SYNC TIP CARRIER ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• VIDEO IN; EIA video signal.	TP401/VA-16	Ø RV5/VA-16
• Disconnect the CN201/VA-16.	4.4 ± 0.05 MHz	
• Short TP4 and TP113/VA-16.		
PAUSE (STANDBY) mode		

12-8. Y FM DEVIATION ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
 VIDEO IN; NTSC color bar signal or any signal that has definite 100% white peak level. Playing back the self-recorded tape with PB ALIGNMENT CHECKER (BW-536). 	VIDEO OUT connector /BW-536 (75 ohms termination)	Ø RV2/VA-16

12-9. C SYNC TIP CARRIER ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
VIDEO IN; EIA video signal	TP404/VA-16	Ø RV302/VA-16
• Disconnect the CN202/VA-16	5.4 ± 0.05 MHz	
• Short TP112 and TP113/VA-16		
PAUSE (STANDBY) mode		

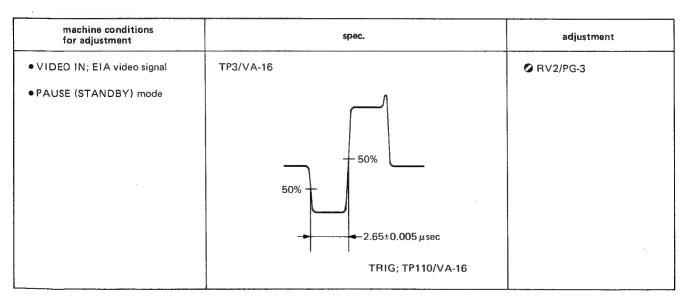
12-10. C FM DEVIATION ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
VIDEO IN; NTSC color bar signal	TP6/CD-25 (BVW-10)	⊘ RV110/VA-16
Playing back the recorded tape with BVW-10.	1.0 ± 0.05 V	

12-11. Y REF SYNC LEVEL ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
• VIDEO IN; EIA video signal	TP3/VA-16	Ø RV1/VA-16
PAUSE (STANDBY) mode	B	
	TRIG; TP110/VA-16 A = 100% refer B = 125 ± 5%	

12-12. Y REF SYNC TIMING ADJUSTMENT

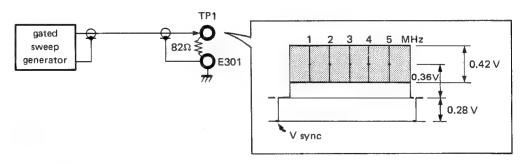


12-13. Y REF SYNC WIDTH ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
VIDEO IN; EIA video signal PAUSE (STANDBY) mode	TP3/VA-16 50% 50% 5.0±0.05 μsec	Ø RV3/PG-3
	TRIG; TP110/VA-16	

12-14. Y HIGH COMPONENT MIX LEVEL ADJUSTMENT

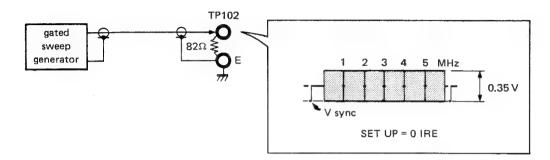
When this adjustment is performed, connect the gated sweep signal to TP1/VA-16 board.



machine conditions for adjustment	spec.	adjustment
VIDEO IN; EIA video signal	IC1-pin 18	Ø RV12/VA-16
 Disconnect the CN201 on the VA-16 board. Connect the gated sweep signal as above-mentioned. PAUSE (STANDBY) mode. 	100±2 mV	
	TRIG; TP110/VA-16	

12-15. C HIGH COMPONENT MIX LEVEL ADJUSTMENT

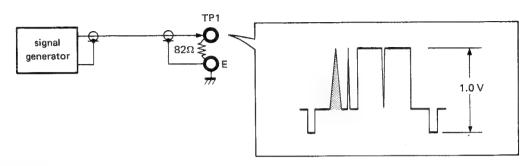
When this adjustment is performed, connect the gated sweep signal to TP102/VA-16 board.

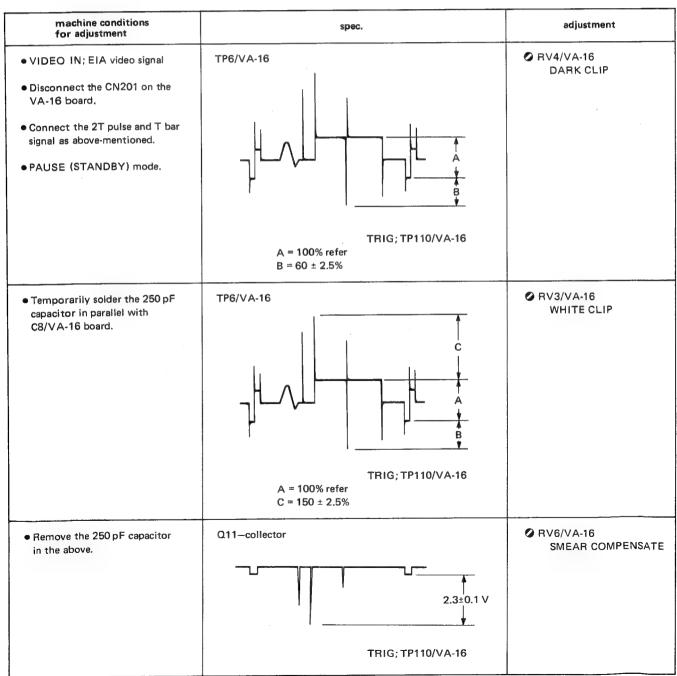


machine conditions for adjustment		spec.	adjustment
• VIDEO IN; EIA video signal	IC301-pin 18		Ø RV304/VA-16
 Disconnect the CN202 on the VA-16 board. Connect the gated sweep signal as above-mentioned. PAUSE (STANDBY) mode. 		100±2 mV	

12-16. Y WHITE/DARK CLIP ADJUSTMENT

When this adjustment is performed, connect the 2Tpulse/T bar with Inv. 2T pulse signal to TP1/VA-16 board.

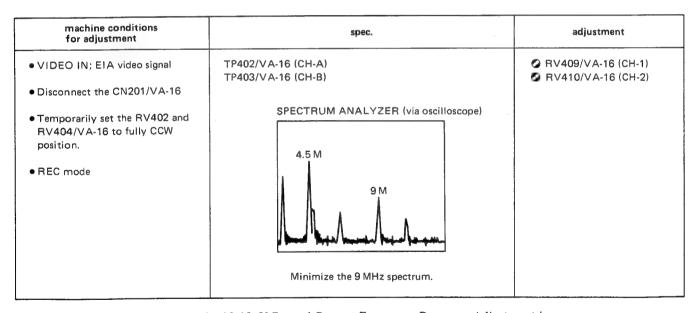




12-17. C HIGH/LOW CLIP ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
VIDEO IN; NTSC color bar signal PAUSE (STANDBY) mode	TRIG; TP110/VA-16 A = 100% refer B = 90 ± 2.5% C = 152.5 ± 7.5%	PV301/VA-16 LOW CLIP PV303/VA-16 HIGH CLIP

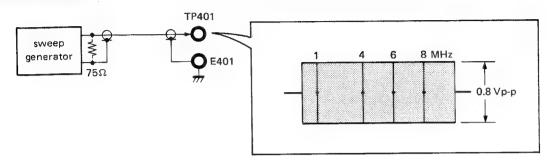
12-18. Y SECONDARY DISTORTION ADJUSTMENT



After completing this adjustment, the 12-19. Y Record Current Frequency Response Adjustment is required.

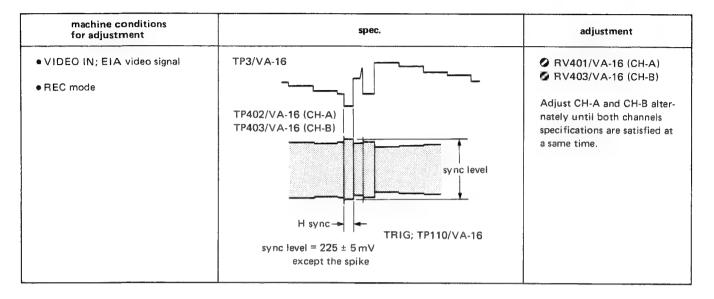
12-19. Y RECORD CURRENT FREQUENCY RESPONSE ADJUSTMENT

When this adjustment is performed, connect the sweep signal to TP401/VA-16 board.

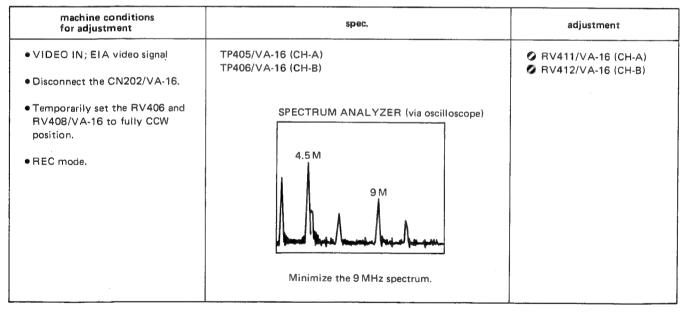


machine conditions for adjustment								
VIDEO IN; EIA video signal Short TP8 and E401/VA-16	TP402/VA-16 (CH-A) TP403/VA-16 (CH-B)		RV402/VA-16 (CH-A)RV404/VA-16 (CH-B)					
 Connect the sweep signal as above-mentioned. REC mode. 		8 MHz						
	Frequency	Level						
	1 MHz	100% refer						
	8 MHz	53 ± 1.7%						

12-20. Y RECORD CURRENT ADJUSTMENT



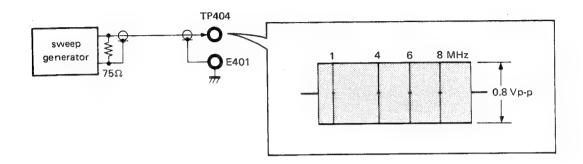
12-21. C SECONDARY DISTORTION ADJUSTMENT



After completing this adjustment, the 12-22. C Record Current Frequency Response Adjustment is required.

12-22. C RECORD CURRENT FREQUENCY RESPONSE ADJUSTMENT

When this adjustment is performed, connect the sweep signal to TP404/VA-16 board.



machine conditions for adjustment								
VIDEO IN; EIA video signal Short TP305 and E402/VA-16	TP405/VA-16 (CH-A) TP406/VA-16 (CH-B)		✓ RV406/VA-16 (CH-A)✓ RV408/VA-16 (CH-B)					
 Connect the sweep signal as above-mentioned. REC mode. 		8 MHz						
	Frequency	Level						
	1 MHz	100% refer						
	8 MHz	50 ± 1.7%						

12-23. C RECORD CURRENT ADJUSTMENT

machine conditions for adjustment	spec.	adjustment				
• VIDEO IN; EIA video signal	TP301/V A-16	© RV405/VA-16 (CH-A) © RV407/VA-16 (CH-B)				
• REC mode						
	TP405/VA-16 (CH-A)					
	TP406/VA-16 (CH-B)					
	pedestal level					
	pedestal					
	TRIG; TP110/VA-16					
	pedestal level = 225 ± 5 mV					

12-24. VIDEO CONFIDENCE CTL MUTE ADJUSTMENT

machine conditions for adjustment	spec.	adjustment
VIDEO IN; EIA video signal REC mode	TP452/VA-16	Adjust the scope horizontal position so that the CTL noise is located in center scale.
	scopes' center	
	TRIG; TP11/SS-23 In the event the CTL noise is not appeared on scope, turn the RV451/AL-6 to CW or CCW direction.	
	TP452/VA-16	Ø RV451/AL-6
	scopes' center	
	A B	
	A = 1.5 m sec B = 2.5 m sec	

12-25. VIDEO CONFIDENCE LEVEL ADJUSTMENT

machine conditions for adjustment	spec.	adjustment				
• VIDEO IN; EIA video signal.	TP453/VA-16	⊘ RV451/VA-16				
• Disconnect the CN206/VA-16.						
• REC mode.	A WWW					
	TRIG; TP11/SS-23 A = more than 6.5 Vp-p					
	B = less than 2.2 Vp-p					

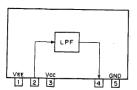
SECTION 14 SEMICONDUCTOR ELECTRODES

SEMICONDUCTOR ELECTRODES

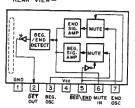
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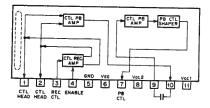
AFL25F 15000G1 (MURATA) ACTIVE LOW-PASS FILTER - IMPRINTED SIDE VIEW



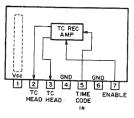
BX1047 (SONY)
TAPE BEGINNING/END DETECTOR
-REAR VIEW-



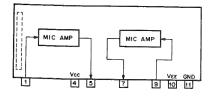
BX1063 (SONY) CTL REC/PB AMP -REAR VIEW-



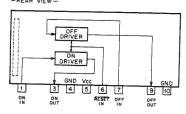
BX1064 (SONY)



BX1066 (SONY) AUDIO MIC AMP -REAR VIEW-

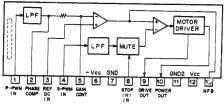


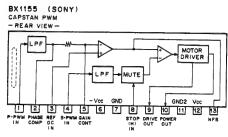
BX1071 (SONY)
PLUNGER DRIVER
-REAR VIEW-



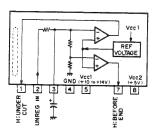
BX1154 (SONY) DRUM PWM - REAR VIEW -



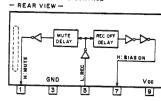




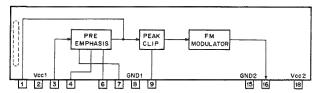
BX1196 (SONY)
BATTERY LEVEL DETECTOR
— REAR VIEW —



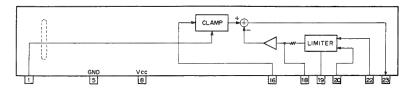
8X3998 (SONY) AODIO MUTE/BIAS CONTROL - REAR VIEW --



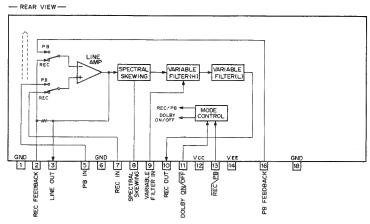
BX1058 (SONY)
PRE-EMPHASIS/PEAK CLIP/FM MODULATOR
-- REAR VIEW ---



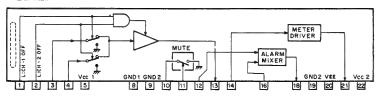
BX 1069 (SONY)
VIDEO CLAMP / HIGH FREQUENCY COMPONENT PRE-EMPHASIS



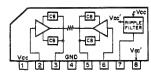
BX1152 (SONY) DOLBY (C TYPE) NOISE REDUCTION SYSTEM



BX3997 (SONY) CHANNEL SELECT AND MONITOR AMP -REAR VIEW -



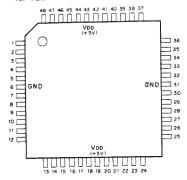
CX184 (SONY)
AUDIO POWER AMP / RIPPLE FILTER
- SIDE VIEW -



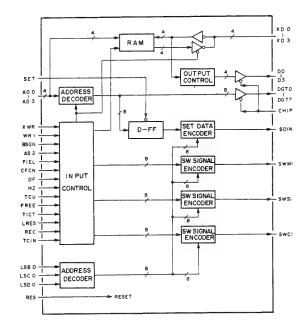
CB; CURRENT BUFFER

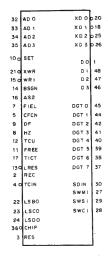
SEMICONDUCTOR ELECTRODES

CX23051 (SONY) FLAT PACKAGE C-MOS TIME CODE GENERATOR (CX7907A) CONTROLLER — TOP VIEW —



			NO.		QUT	SYMBOL	NO.	1 N	OUT	SYMBOL_	NO.	_		SYMBOL
	0	DO	13	0		LRES	25	0	0	X D2	37		0	DGT 7
0	Ť	REC	14	O		BSGN	26	0	0	× 0 3	38	Γ'	0	DGT 6
ō		RES	15	0		WR1	27		0	SWM 1	39	L	0	DGT 5
ŏ	_	TC IN	16	0		45 Z	28		0	SWC 1	40		0	DGT 4
ŏ		CFCN	17	0		TICT	29		0	SWSI	41		0	DGT 3
		GND	18	0	0	XD1	30		0	SDIN	42		0	DGT 2
0			19		-	Vac	31			GND	43			V DD
ō		HZ	20	0	0	XD O	32	0		ADO	44		0	DGT 1
ō		DF	21	0		XWR	33	0		AD1	45		0	DGTO
Ö		SET	22	0		LSBO	34	0		AD2	46		0	D3
õ		FREE	23	Ō	\vdash	LSC 0	35	0		AD3	47		0	0.5
ŏ	_	TCU	24	0		L500	36	0		CHIP	48		0	D 1
1		0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	O RES O TC IN O CFCN GND O FIEL O HZ O DF O SET O FREE	O RES 15 O TC IN 16 O CFGN 17 GND 18 O FIEL 19 O HZ 20 O DF 21 O SET 22 O FREE 23	RES 15 O	NES 15 0 0 0 0 0 0 0 0 0	O RES 15 O WR1 T C IN 66 O AS2 O C FGN 17 O TICT GND 18 O O XD 1 O FIEL 19 O BY 20 O XD 0 DF 21 O XWR O SET 22 O LSEO O FREE 23 O LSCO	O RES 15 O WR1 27 T C IN 6 O AS 2 28 O CFGN 17 O TICT 30 GND 18 O O XD 1 30 FIEL 19 Voe 31 O HZ 20 O O XD 0 32 O DF 21 O XWR 33 O SET 22 O LSSO 35 O FREE 23 O LSCO 35	O RES 15 O WR1 27 TC IN 16 O ASS 28 O CFGN 17 O TICT 29 GND 18 O XD1 30 FIEL 19 Vob 31 O HZ 20 O XD0 32 O DF 21 O XWR 33 O SET 22 O LSE0 34 O FREE 23 O LSC 0 35 O	O RES 15 O WR1 27 O O TC IN 6 O AS2 26 O O CFGN 17 O TICT 29 O GND 16 O X0 1 30 O FIEL 19 Vob 31 O HZ 20 O X 00 32 O O DF 21 O XWR 33 O O SET 22 O LSEO 35 O FREE 23 O LSC 0 35 O	O RES 15 O WR1 27 O SWM1 O TC IN 16 O AS2 28 O SWC1 O FOR 17 O TICT 29 O SW51 GND 18 O XD1 30 O SDIN FIEL 19 Vob 31 GND O HZ 20 O XD0 32 O AD0 O DF 21 O XWR 33 O AD1 O SET 22 O LSBO 35 O AD2 O FREE 23 O LSCO 35 O AD3		RES 15 O WR1 27 O SWM 39	O RES 15 O WAT 27 O SWM 1 39 O O TC IN 16 O AS2 28 O SWC 1 40 O O CFCN 17 O TICT 29 O SWS 41 O O FIEL 19 Vab 31 GNO 43 O FEL 19 Vab 31 GNO 43 O DF 21 O XWR 33 O ADD 44 O FEE 23 O LSCO 35 O AD 47 O O FREE 23 O LSCO 35 O AD 47 O

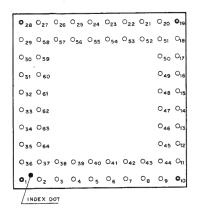




```
ADDRESS DATA INPUT
AD3
           L : COLOR FRAME LOCK INPUT
          BUSY GENERATOR INPUT
COLOR FRAME CONTROL INPUT
CHIP SELECT INPUT
BSGN
CFCN
CHIP
DO
          DISPLAY DATA OUTPUT
D3
           HIDROP FRAME/LINDE INPUT
DF
DGT 0 | DIGIT DATA OUTPUT
          FIELD SIGNAL INPUT
H:FREE RUN/L:REC RUN INPUT
H:30Hz/L:25Hz INPUT
L:TIMER RESET INPUT
FIEL
HZ
LRES
LSG 0
LSC 0
LSD 0
           LTC SYNCHRONOUS SIGNAL INPUT
           HIREC MODE INPUT
           POWER ON RESET INPUT
RES
SDIN
SET
           SET DATA OUTPUT
DATA SET PULSE INPUT
 SWC1
SWMI
SWSI
            SWITCHES SIGNAL OUTPUT
            SLAVE LOCK SIGNAL INPUT
H:TC/L:UB INPUT
H:TC, UB/L:TIMER INPUT
WRITE 1 (CONNECT TO BSGN)
 TCIN
TCU
TICT
 WR1
            DATA BUS INPUT/OUTPUT
 x b 3
            WRITE PULSE INPUT
```

SEMICONDUCTOR ELECTRODES

CX7907A (SONY) C-MOS TIME CODE GENERATOR — TOP VIEW —



	23	50	61	39	38	52	4	5	43	42	53	24		22	4 6	0 4	
	PORI	CKIN	CKO	SLCK	T ST2	TST3	TSA1	1051	1052	1053	TISI	1131	DBC	TIS3	VBD (+5V)	GND	
59 31 27 26 21 22	VTO VTG CSII NES LTC RSY	O N Y														SCKO LSBO LSCO LSDO SWSI SWMI	4 3 2 1 62 34
28 5 14	VDC HDC	0														SWCI SWVI SDIN TITO	63 33 32 64 36
25 58 30	LSF	10														TRMO TRMO TVMO	37 35
29 60	FW CFI	RE														BSGN	50
	6-0 DCS	•	44 000	46 002	003	8 ACS	15 AD 0	48		4D 2	49 AD 3	17 AD 4	10	=	12 012	13 01 3	

PIN ASSIGNMENT

$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$																
1		IN	OUT	SYMBOL	1	IN	OUT	SYMBOL		IN	OUT	SYMBOL	1	IN	OUT	
2	1			LSDO			0	AD4	33	0		SWVI			.0	
3	2				18		o o	XDB	34	0		SWMI	50		0	
4	3		_				-		35		0	TVMO	51_	0		
Tisi	Ă	_				0			36		0	TNDO	.52	0_		TST3
6 0 DCS 22 0 RSYW 38 0 TST2 54 0 GND 7 0 WR 23 0 PORI 39 0 SLCK 55 0 TIS3 8 0 ACS 24 0 PRM 40 0 GND 56 0 DBCI 9 0 DO0 25 0 LSHO 41 0 TSM1 57 0 TIS1 10 0 D10 26 0 NESY 42 0 TOS3 58 0 LCKI 11 0 D11 27 0 CSIN 43 0 TOS2 59 0 VTO 12 0 D12 28 0 LTO 44 0 DO1 60 0 CFER 13 0 D13 29 0 FWRE 45 0 DO2 61 <td< td=""><td></td><td></td><td>-</td><td></td><td></td><td>-</td><td></td><td></td><td>37</td><td></td><td>0</td><td>TRMO</td><td>53</td><td>0.</td><td></td><td></td></td<>			-			-			37		0	TRMO	53	0.		
7						- -	0		3.8	0		TST2	54	Γ	0	GND
8 0 ACS 24 0 FRM 40 0 GND 56 0 DBCI 9 0 D00 25 0 LSHO 41 0 TSAI 57 0 TISI 10 0 D10 26 0 NESY 42 0 TOS3 58 0 LCKI 11 0 D11 27 0 CSIN 43 0 TOS2 59 0 VTO 12 0 D12 28 0 LTCO 44 0 D01 60 0 CFFR 13 0 D13 29 0 FWRE 45 0 D02 61 0 VDD(+5V) 14 0 HDO 30 0 CTL1 46 0 D03 62 0 SWG1 15 0 ADD 31 0 VTGO 47 0 VVDD(+5V) 63 <td>7</td> <td></td> <td></td> <td></td> <td></td> <td>_</td> <td>- V</td> <td></td> <td></td> <td>0</td> <td></td> <td>SLCK</td> <td>55</td> <td>0</td> <td></td> <td>TIS3</td>	7					_	- V			0		SLCK	55	0		TIS3
9	6	_	-			-			40	_	0	GND	56	0		DBCI
10		<u> </u>				_				0			57	0		TISl
11 0 D11 27 0 C\$IN 43 0 T\$\sqrt{3}\$ 59 0 VTO 12 0 D12 28 0 LTCO 44 0 D01 60 0 C\$FR 13 0 D13 29 0 F\$WRE 45 0 D02 61 0 VDD(+5V) 14 0 HDO 30 0 C\$TL1 46 0 D03 62 0 S\$W\$1 15 0 ADD 31 0 V\$TGO 47 0 V\$TD(+5V) 63 0 S\$W\$1 \$W\$1.							-		42				58	0		LCKI
12	110						-			_	1		59		0	VTO
13 o D13 29 o FWRE 45 o D02 61 o VDD(+5V) 14 Q HDO 30 o CTL1 46 o D03 62 o SWS1 15 o ADO 31 o VTGO 47 o VDD(+5V) 63 o SWC1	11	_	_			<u> </u>				ΙŤ	0		60		0	CFER
14 0 HDO 30 0 CTL 46 0 DO3 62 0 SWS1 15 0 ADO 31 0 VTGO 47 0 VDD(+5V) 63 0 SWCI							-				-			0		VDD (+5V)
15 0 AD0 31 0 VTGO 47 0 VDD(+5V) 63 0 SWCI		0				_								0		
15 0 ADO 31 0 VIGO 47 0 TDS 1 mymo		—				ν.				_				0		SWCI
	16	<u> </u>	0	AD0	31	0	-0	SDIN	48			AD1	64	T-	0	TITO

#32 SDIN

LSDO	LSCO	LSBO	SDIN	FUNCTION				
0	0	0		INCREASE IN BIT 'FR or Ul'				
0	0	1		INCREASE IN BIT 'FT or U2'				
0	1	0		INCREASE IN BIT 'SE or U3'				
0	1	1	Z.	INCREASE IN BIT 'ST or U4'				
1	0	0		INCREASE IN BIT 'MN or U5'				
1	0	1		INCREASE IN BIT 'MT or U6'				
1	1	0		INCREASE IN BIT 'HR or U7'				
1	1	1	Ī	INCREASE IN BIT 'HT or U8'				
	NOTE; INFLUENCED BIT IS DECIDED							
				BY PIDOW 2 BIWS OF SWOT				

#62 SWSI

LSDO	LSCO	LSBO.	SWSI	FUNCTION
0	0	0	FBS1*	VITC FIELD MARK/
0	0	1	FBS2*	LTC PHASE CORRECTION
0	. 1	0	PBS3*	POSITION SELECT
0	1	1	. 0	PHASE CORRECTION ON
0	1	1	1	PHASE CORRECTION OFF
1	0	0	S1**	SIGNAL FORMAT
1	. 0	1	S2**	SELECT
1	1	0	S4**	SEBECT
1	11	1	×	-
				x:DON'T CARE.

LSDO LSCO LSBO SWCI

0 0 1 0 CTL 0 0 0 1 1 TIME/U-BIT 0 1 0 0 1 1 DATA RESET ON*2 0 1 1 0 DATA RESET OFF 1 0 0 1 1 DATA RESET OFF 1 0 0 1 TIME DATA HOLD 1 0 0 1 TIME DATA RUN 1 0 1 CATERNAL DATA LOAD*2 1 1 0 0 EXTRAPOLATION ON 1 1 0 EXTRAPOLATION OFF 1 1 1 X X; DON'T CARE.								
0 0 1 1 TIME/U-BIT1 0 1 0 x 0 1 1 0 x 0 1 1 1 0 DATA RESET ON*2 0 1 1 1 1 DATA RESET OFF 1 0 0 0 TIME DATA HOLD 1 0 0 1 TIME DATA RUN 1 0 1 1 EXTERNAL DATA LOAD*2 1 1 0 0 EXTRAPOLATION ON 1 1 0 EXTRAPOLATION OFF 1 1 1 X x; DON'T CARE.	-0	.0	1	0	CTL			
0 1 1 0 DATA RESET OM*2 0 1 1 1 DATA RESET OFF 1 0 0 0 TIME DATA HOLD 1 0 0 1 TIME DATA HOLD 1 0 1 TIME DATA RUN 1 0 1 EXTERNAL DATA LOAD*2 1 1 0 0 EXTRAPOLATION ON 1 1 0 1 EXTRAPOLATION OFF 1 1 1 X X DON'T CARE.	0	_0_	1	1	TIME/U-BIT	DDDDC1 1		
0 1 1 1 DATA RESET OFF 1 0 0 0 TIME DATA HOLD 1 0 0 1 TIME DATA RUN 1 0 1 1 EXTERNAL DATA LOAD*2 1 1 0 0 EXTRAPOLATION ON 1 1 0 1 EXTRAPOLATION OFF 1 1 1 X x; DON'T CARE.	0	1	0_	х				
1 0 0 0 TIME DATA HOLD 1 0 0 1 TIME DATA RUN 1 0 1	0	1	1	0	DATA RESET	ON*2		
1 0 0 0 TIME DATA HOLD 1 0 0 1 TIME DATA RUN 1 0 1	0	1	1	1	DATA RESET	OFF		
1 0 1 1 EXTERNAL DATA LOAD*2 1 1 0 0 EXTRAPOLATION ON 1 1 0 1 EXTRAPOLATION OFF 1 1 1 1 x x; DON'T CARE.	1	0	0	0	TIME DATA H	OLD		
1 1 0 0 EXTRAPOLATION ON 1 1 0 1 EXTRAPOLATION OFF 1 1 1 X x; DON'T CARE.	1	0	0	1	TIME DATA R	UN		
1 1 0 0 EXTRAPOLATION ON 1 1 0 1 EXTRAPOLATION OFF 1 1 1 1 X x; DON'T CARE.	1	0	1	1	EXTERNAL DA	TA LOAD*2		
1 1 0 1 EXTRAPOLATION OFF 1 1 1 1 X x; DON'T CARE.	1	1	0	0				
1 1 1 x - x; DON'T CARE.	1	1	0	1	EXTRAPOLATI	ON OFF		
	1	1	1	x	_			
			X; DO	N'T CAR	E.			
*1:REFER TO TIMING CHART (DATA OUT	*1; REFER TO TIMING CHART (DATA OUT).							
*2: INFLUENCED DATA IS DECIDED BY								
FIRST 2 BITS OF SWCI.								
ROR BYPASS ALGORITHM								

#33 SWVI

LSDO	LSCO	LSBO	SWVI	FUNCTION
0	0	0	SWIAt	
0	0	1	SWIBt	VITC POSITION SELECT
. 0	1	0	SW1C†	A
0	1	1	SW1D†	
1	0	0	SW2A†	
1	0	1	SW2B†	VITC POSITION SELECT
1	1	0	SW2C†	В
1	1	1	SW2D†	

*; VITC FIELD MARK/LTC PHASE CORRECTION POSITION SELECT

FBS3	FBS2	FBS1	FIELD MARK	LTC BIT					
	1 000		POSITION	No.					
0	0	0	ASI	10					
0	0	1	AS2	11					
0	1	0	AS3	27					
0	1	1	AS4	43					
1	0	0	AS5	58					
1	0	1	AS6	59					
1	1	0	-	-					
1	1	1	-	-					
	NOTE; LTC PHASE CORRECTION BIT OF								
	CY70A7 IS BIVED ON BIT-63								

ERROR BYPASS ALGORITHM

NO!	CX7	907		
**;SIGNAL	FORMA	T SI	ELE	CT

SWID	SW1C	SWIB	SWIA	INSER	TION LINE
SW2D	SW2C	SW2B	SW2A	NTSC	PAL, SECAM
0	. 0.	0	. 0	LINE 25	LINE 22,335
0	0	0	1	24	21,334
0	0	1	0	23	20,333
0	0	1	1	22	19,332
0	1	0	0	21	18,331
0	1	0	1	20	17,330
0	1	1	0	19	16,329
0	1	1	1	18	15,328
1	0	. 0	0	17	14,327
1	0	0	1	16	13,326
1.	0	11_	0	15	12.325
1	0	1	1	14	11,324
1	1	0	0	13	10,323
1	1	0	1	12	9,322
1	11	1	0	11	8,321
1	1	1	1	10	7,320

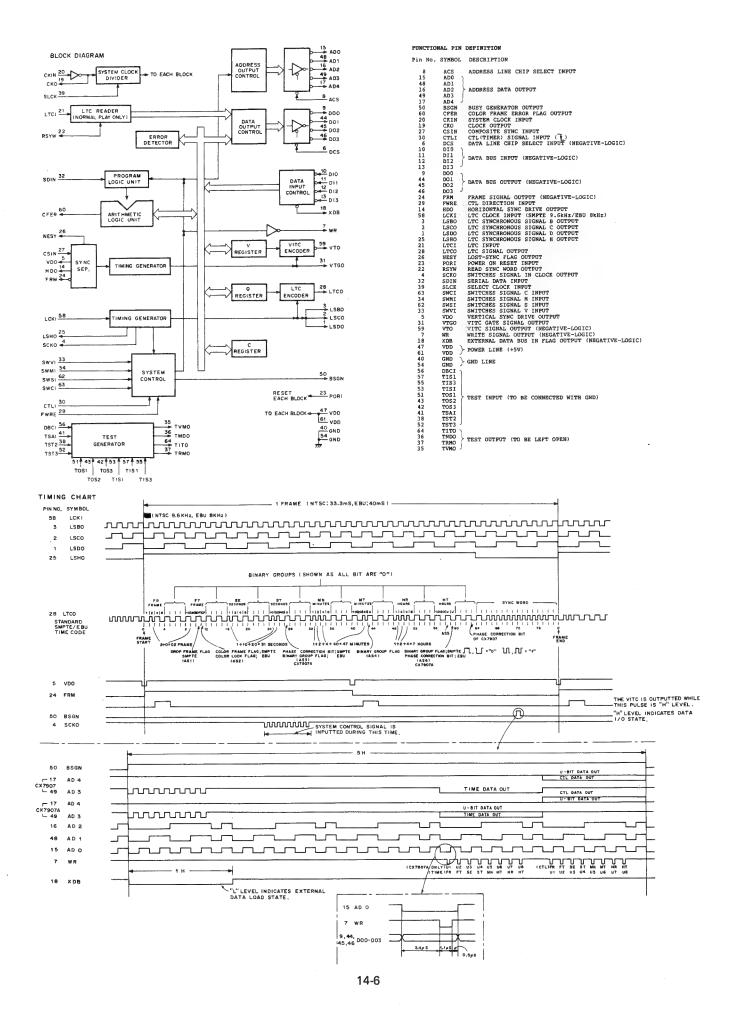
54	152	PT	FURMAT	FRAME
0	0	0	FILM	24
0	0	1	NOT ALLOWED	_
0	1	x	NOT ALLOWED	1
1	0	0	PAL, SECAM	25
1	0	1	NOT ALLOWED	-
1	1	0	NTSC NDF	30
1	1.1	1	NTSC DF	30
			DF; DROP FR	
			NDF; NON DR	OP FRAME
			x; DON'T CA	RE.

START	
DOES TIME	
CODE READER READ A SYNC WORD WHEN	0
BSGN PULSE RISING?	
Yes	
IS THERE	0
BETWEEN THE SYNC WORDS?	
Yes	
GENERATOR REFERENCE TIME DATA N	_
=READ TIME DATA	~
Yes	
Yes ERRO	R COUNT=3?
	ERROR COUNT: **
ERROR COUNT:=0	ERROR COUNT:=
LOAD TIME DATA 26-BIT	INTERNAL TIME DATA :=INTERNAL TIME
AND U-BIT 32-BIT	DATA + 1 FRAME
END	NOTE; ERROR COUNTER IS MOD-4 COUNTER.
L L L L L L L L L L L L L L L L L L L	

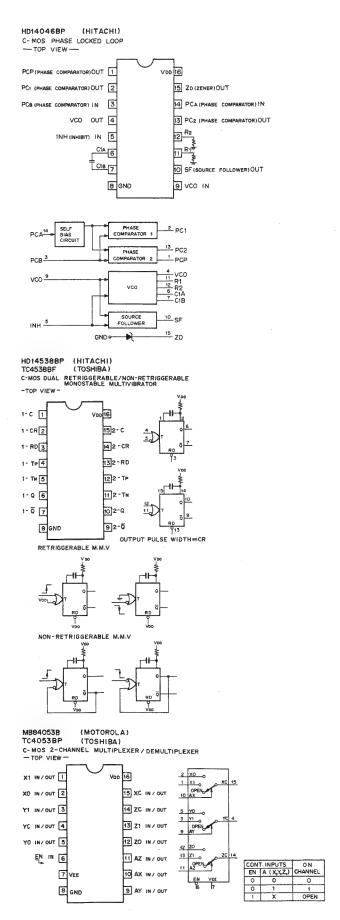
#34 SWMI

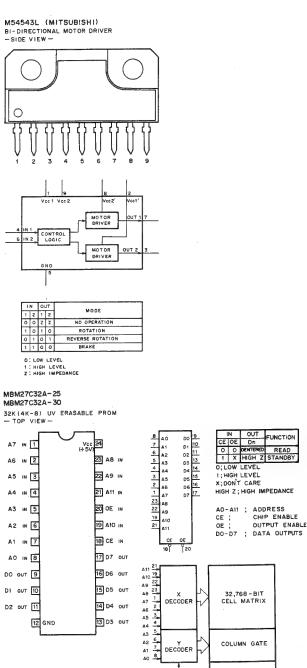
LSDO	LSCO	LSBQ	SWMI	FUNCTION
0	0	0	х .	INSERT SWMI DATA INTO BIT 'AS1' (NEGATIVE-LOGIC)
0	0	1	X	INSERT SWMI DATA INTO BIT 'AS2' (NEGATIVE-LOGIC)
0	1	. 0	X	INSERT SWMI DATA INTO BIT 'AS3' (NEGATIVE-LOGIC)
. 0	1	1	х	INSERT SWMI DATA INTO BIT 'AS4' (NEGATIVE-LOGIC)
1	0	0	X	INSERT SWMI DATA INTO BIT 'AS5' (NEGATIVE-LOGIC)
1	0	1	X	INSERT SWMI DATA INTO BIT 'AS6' (NEGATIVE-LOGIC)
1	1	0	5	COLOR FRAME LOCK IN FIELD 1
	1	1	0	COLOR FRAME OFF
1	1	. 1	1	COLOR FRAME ON
				X; DON'T CARE.

SEMICONDUCTOR ELECTRODES



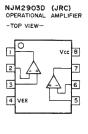
SEMICONDUCTOR ELECTRODES

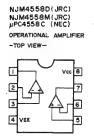


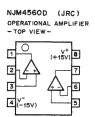


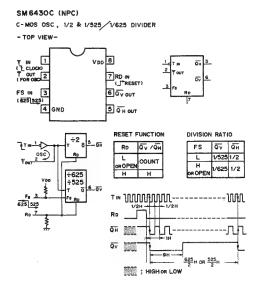
OE , CE

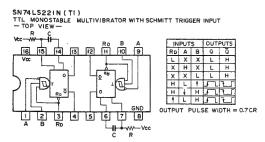
OUTPUT BUFF

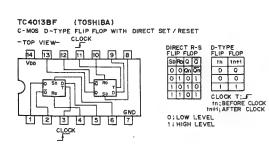


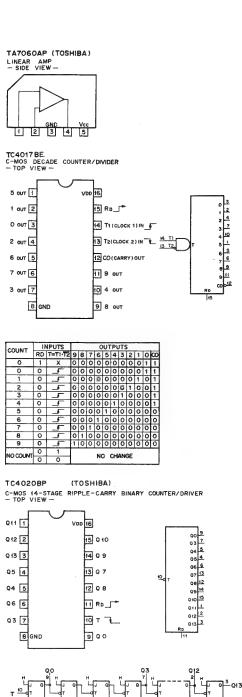


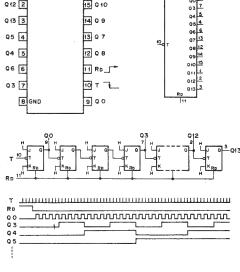


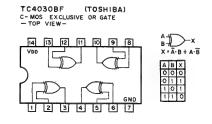


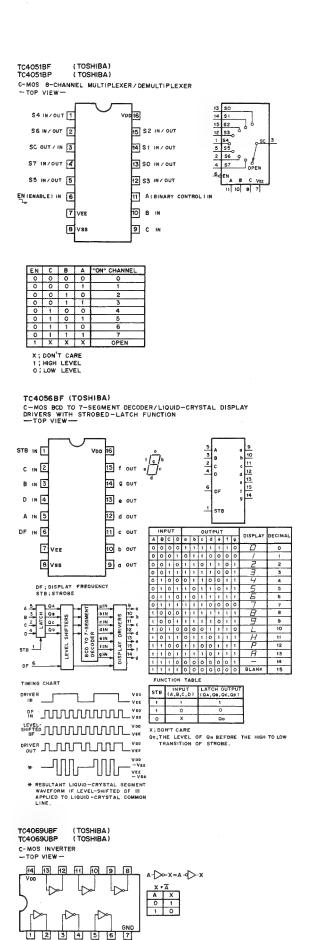


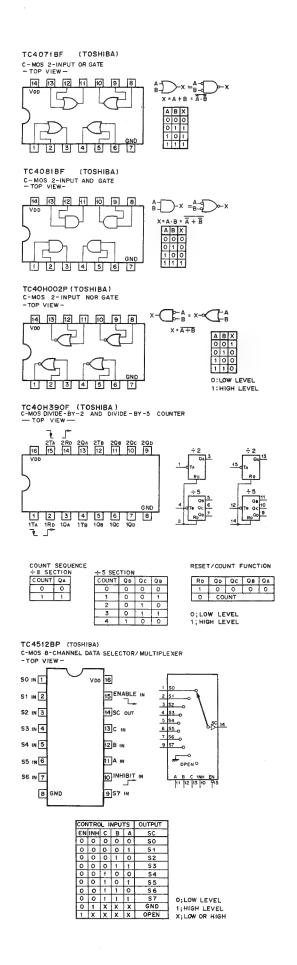




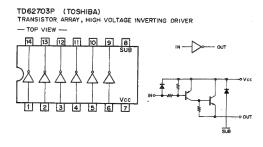


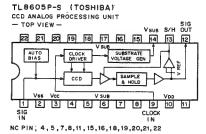






SEMICONDUCTOR ELECTRODES



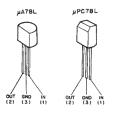


µPC143□□H (NEC) POSITIVE VOLTAGE REGULATOR (1A)



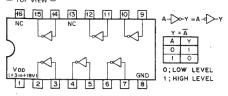


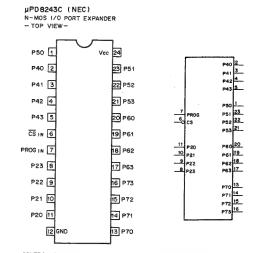
µPC78LDD (NEC)
POSITIVE VOLTAGE REGULATOR(100mA)





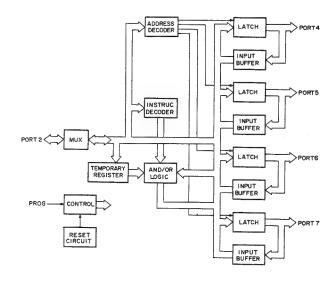
TC4049BF (TOSHIBA) FLAT PACKAGE C-MOS INVERTING TYPE BUFFER/CONVERTER --- TOP VIEW ---

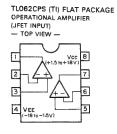




	CONTROL AND PORT ADDRESSING					
P23	P22	P21	P20	PORT	CONTROL	
0	0	0	0.	4		
0	0	0	1	5	READ	
0	0	1	0	6	READ	
0	0	1	1	7	l	
0	1	0	0	4		
0	1	0	1	5	WRITE	
0	1	1	0	6	WRITE	
0	1	1	. 1	7		
1	.0	0	0	4		
1	0	0	1	5	OR	
1	0	1	0	6	OK .	
1	0	1	1	7		
1	1	0	0	4		
1	1	0	1	5	AND	
1	1	1	0	6	AND	
1	1	_1	1	7		

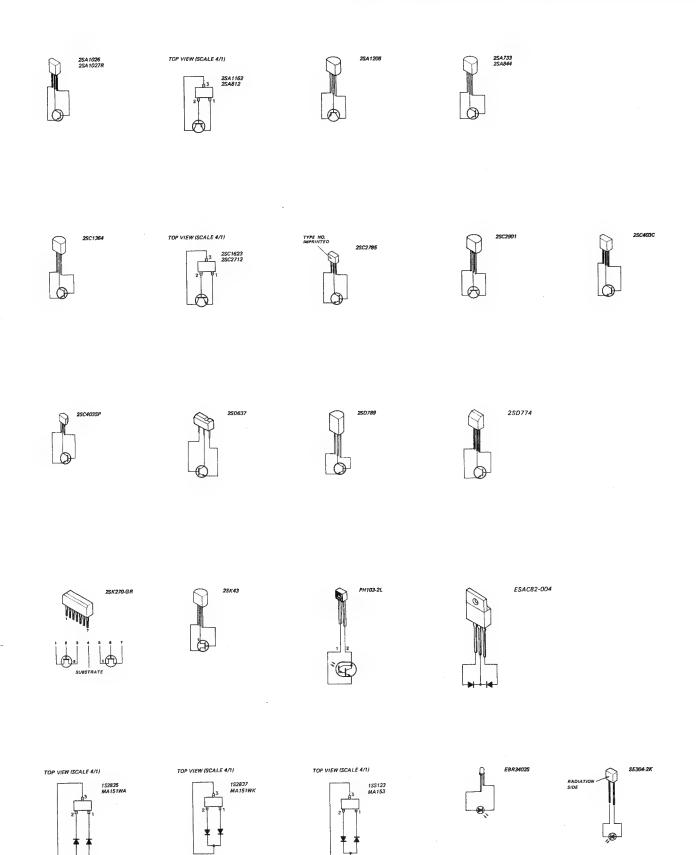
PROG; PROGRAM PULSE INPUT ĈŜ; CHIP SELECT INPUT P20~P23; I/O PORT2 (FOR CPU) P40~P43; I/O PORT4 P50~P53; I/O PORT5 P60~P63; I/O PORT6 P70~P73; I/O PORT7





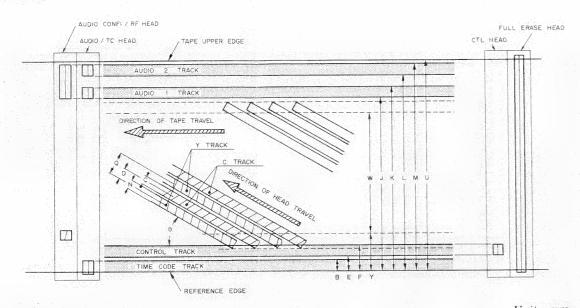


SEMICONDUCTOR ELECTRODES



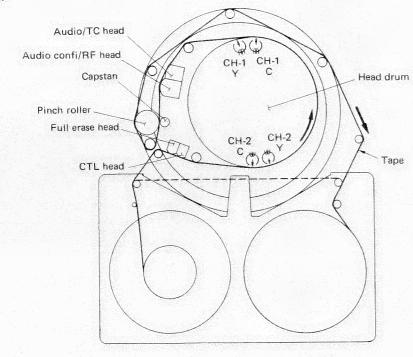
SECTION 15 PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

TAPE PATTERN

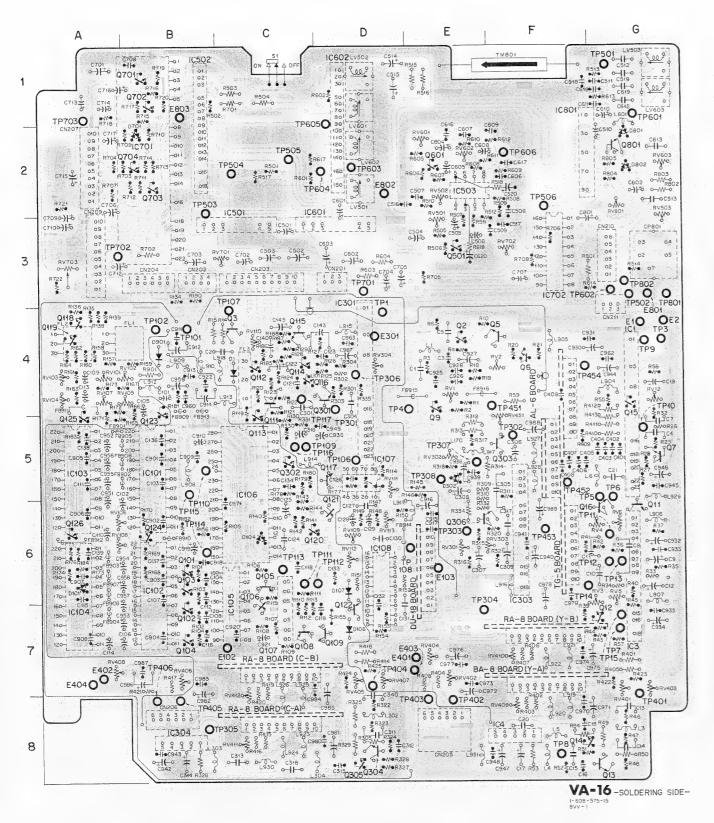


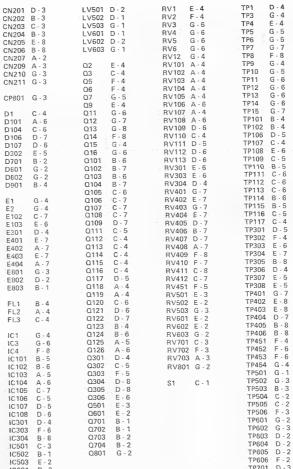
					Unit: mm
B : Time	e Code Track Upper Edge	0.4	L :	Audio 2 Track Lower Edge	11.85
C : C Tr	ack Width	0.073	M :	Audio 2 Track Upper Edge	12.45
D : Y-0	Track Pitch	0.0805	N :	Y Track Width	0.073
E : Cont	trol Track Lower Edge	0.7	Q :	Video Track Pitch	0.161
F : Con	trol Track Upper Edge	1.1	U :	Tape Width	12.7
J : Aud	io 1 Track Lower Edge	10.85	W :	Video Area Effective Width	9.384
K : Aud	io 1 Track Upper Edge	11.45	Y :	Lower Limit of W	1.248
			Θ:	Track Angle	4.679°

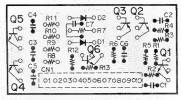
TAPE TRANSPORT



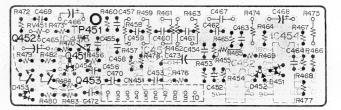
RA-8 AL-6 TG-5



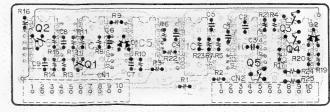




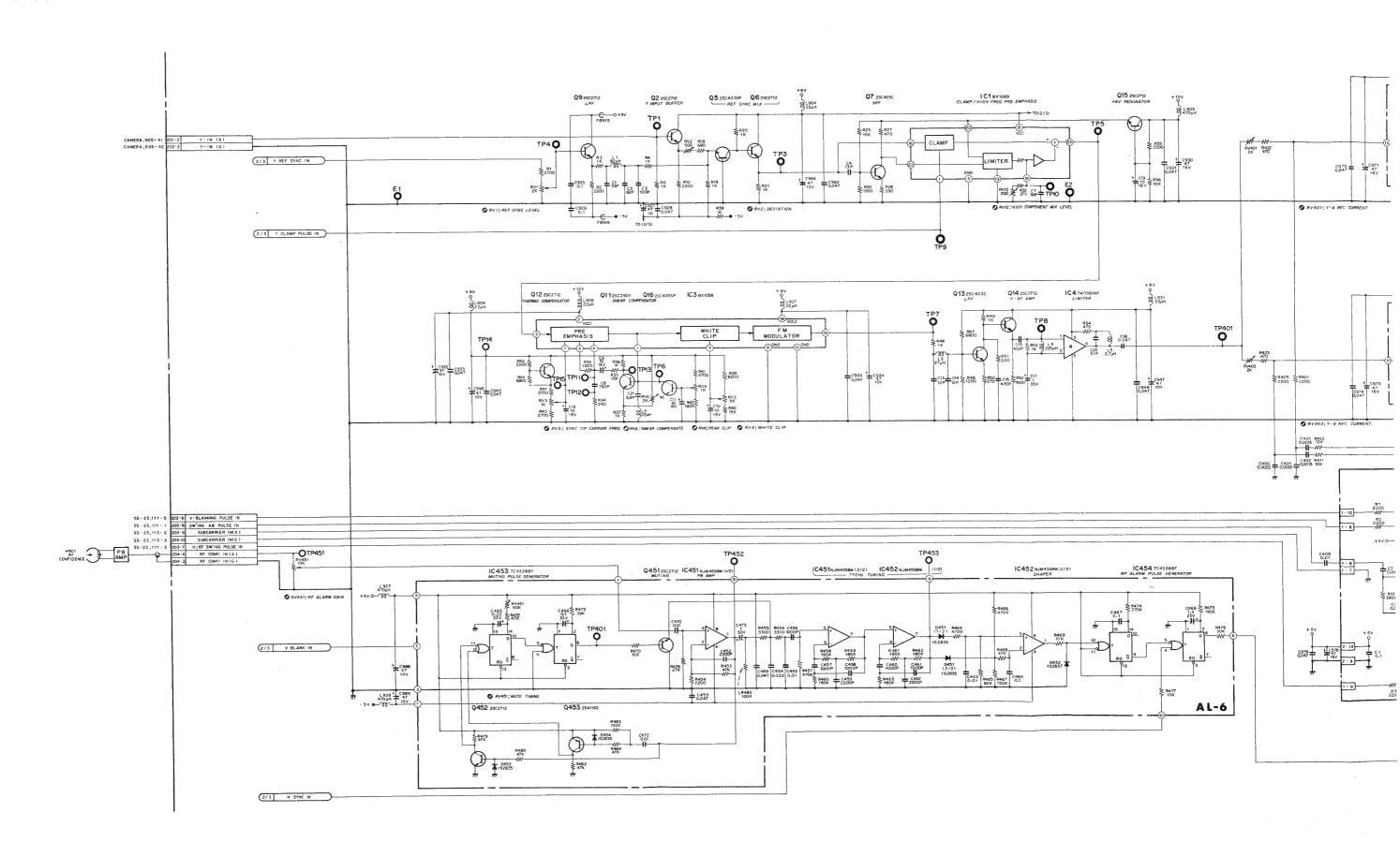
RA-8-SOLDERING SIDE-1-608-026-11,12 BVV-1

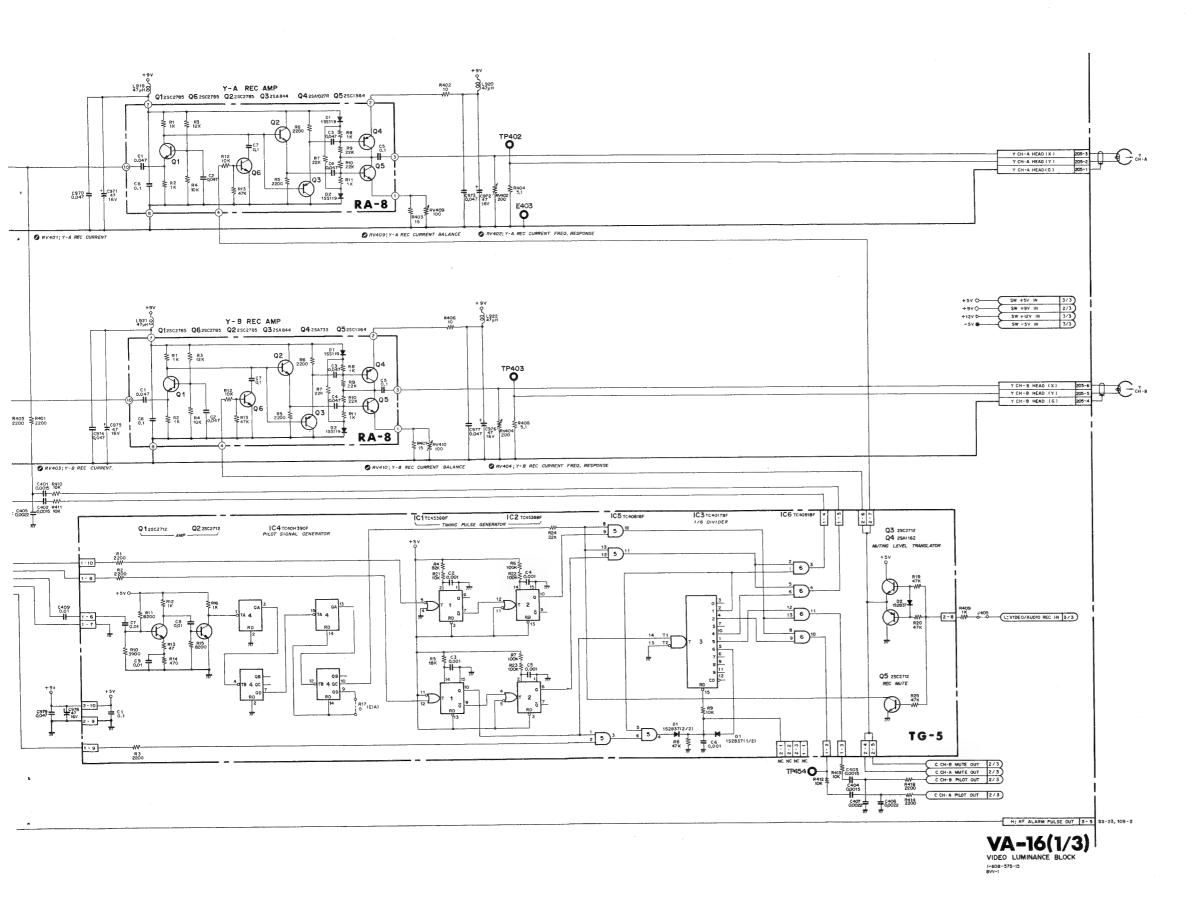


AL-6-SOLDERING SIDE-1-608-694-13 BVV-1

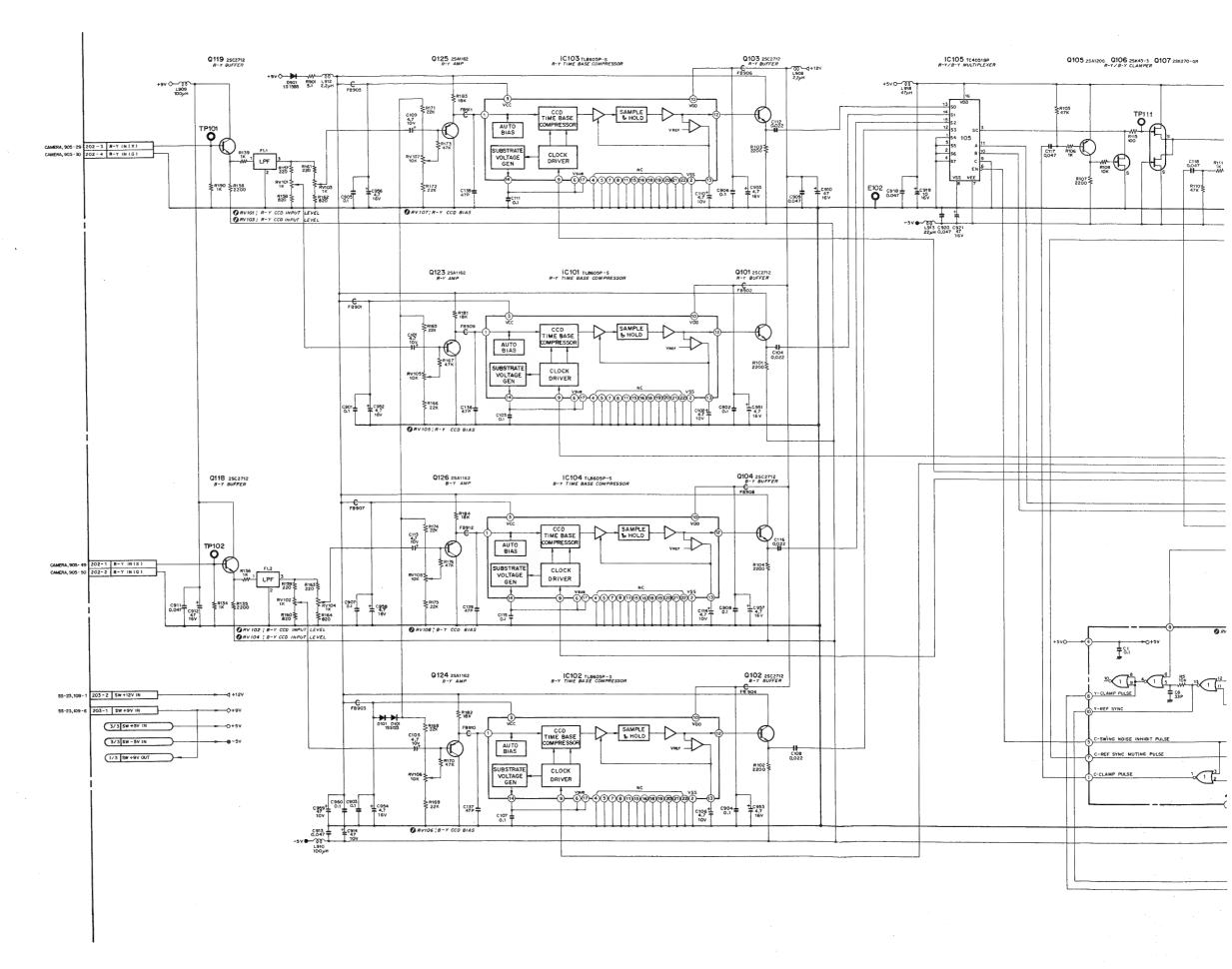


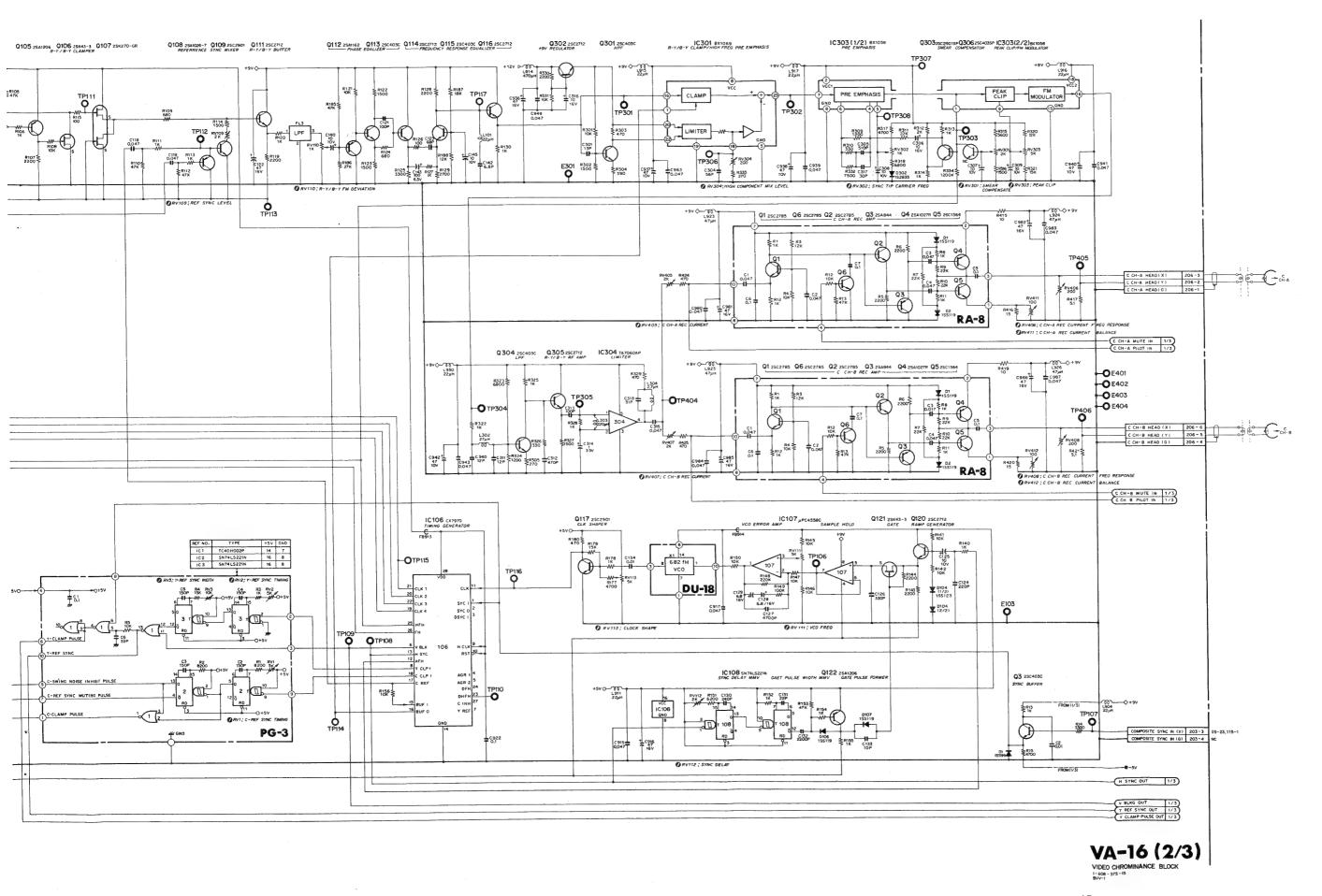
TG-5 - SOLDERING SIDE -



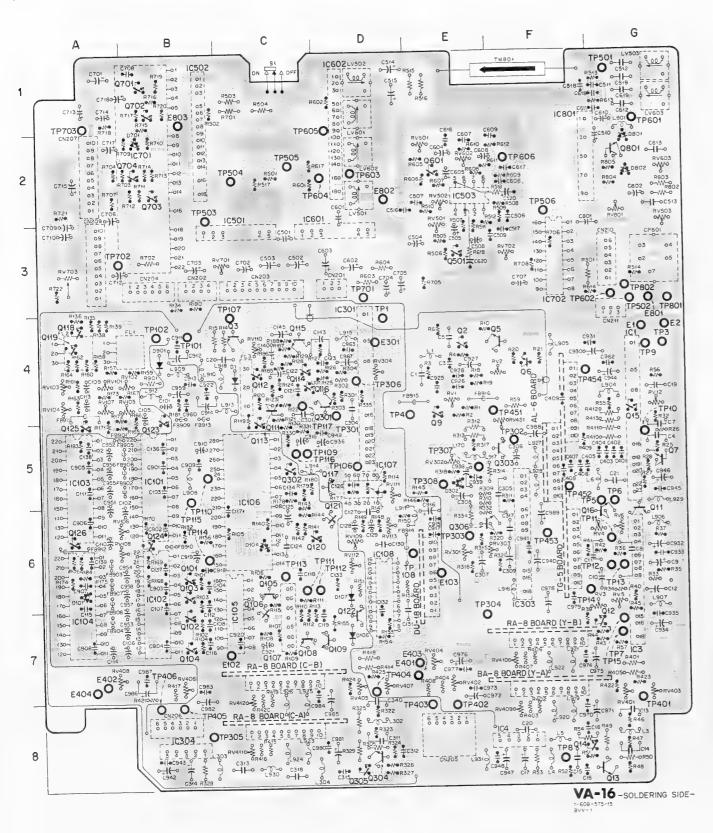


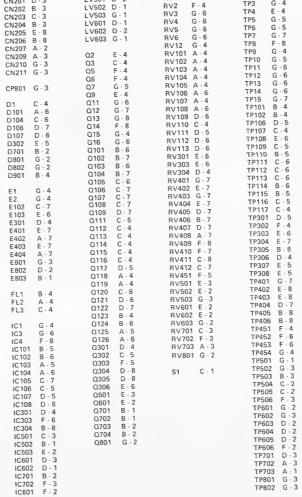
VA-16 (2/3) (VIDEO CHROMINANCE SYSTEM)

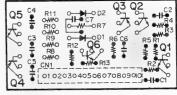




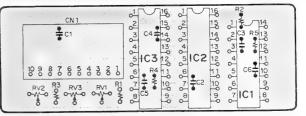
VA-16 (VIDEO CHROMINANCE SYSTEM) RA-8 PG-3 DU-18



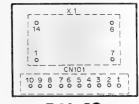




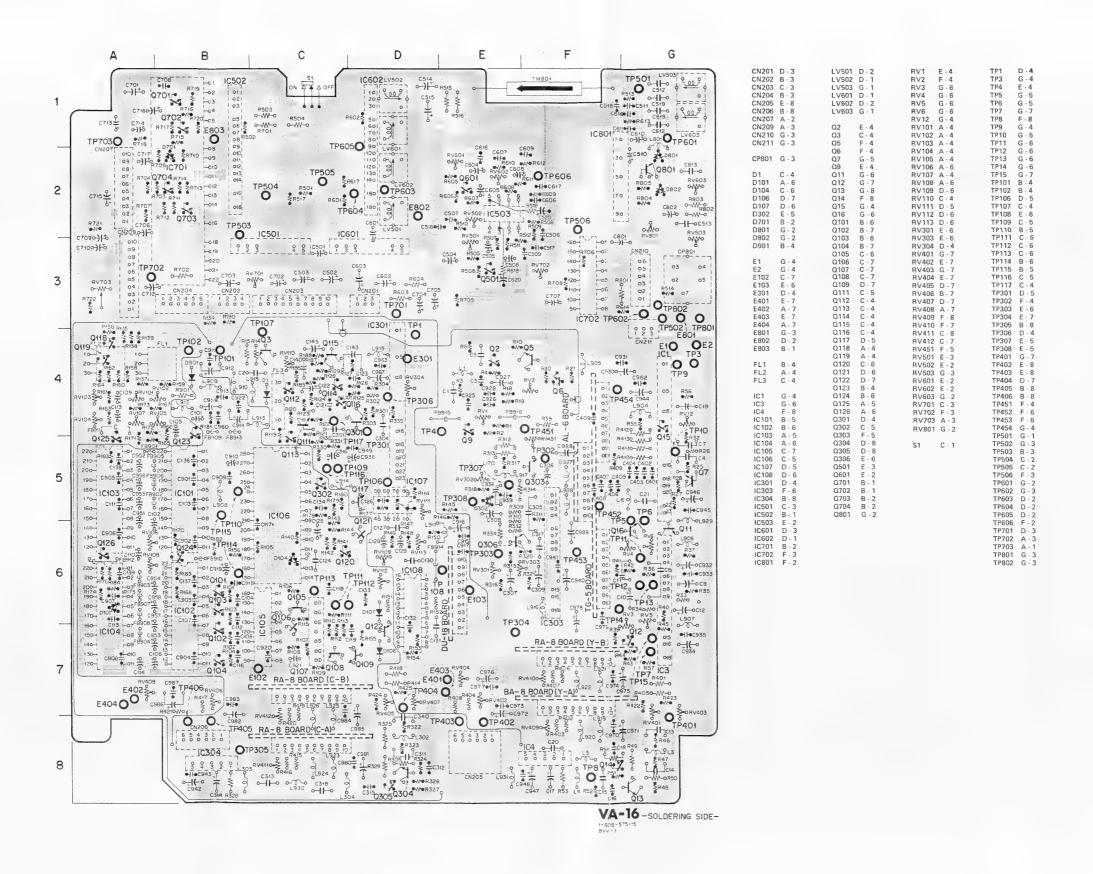
RA-8-SOLDERING SIDE-



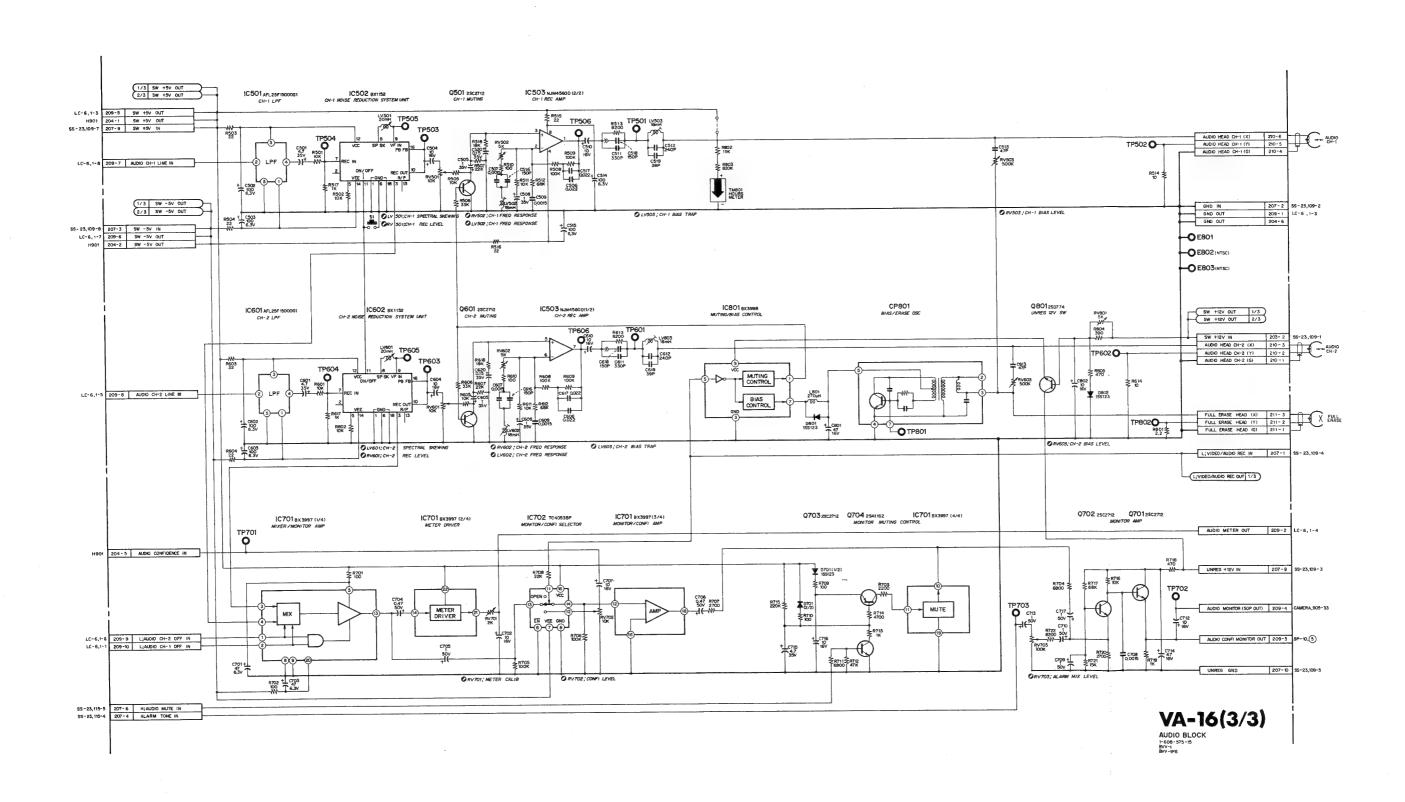
PG-3-COMPONENT SIDE-



DU-18
-SOLDERING SIDE1-608-823-11,12
BVV-1PS

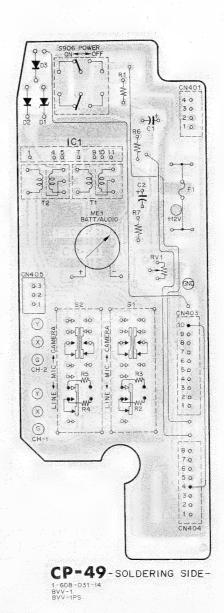


VA-16 (3/3) (AUDIO RECORD SYSTEM)

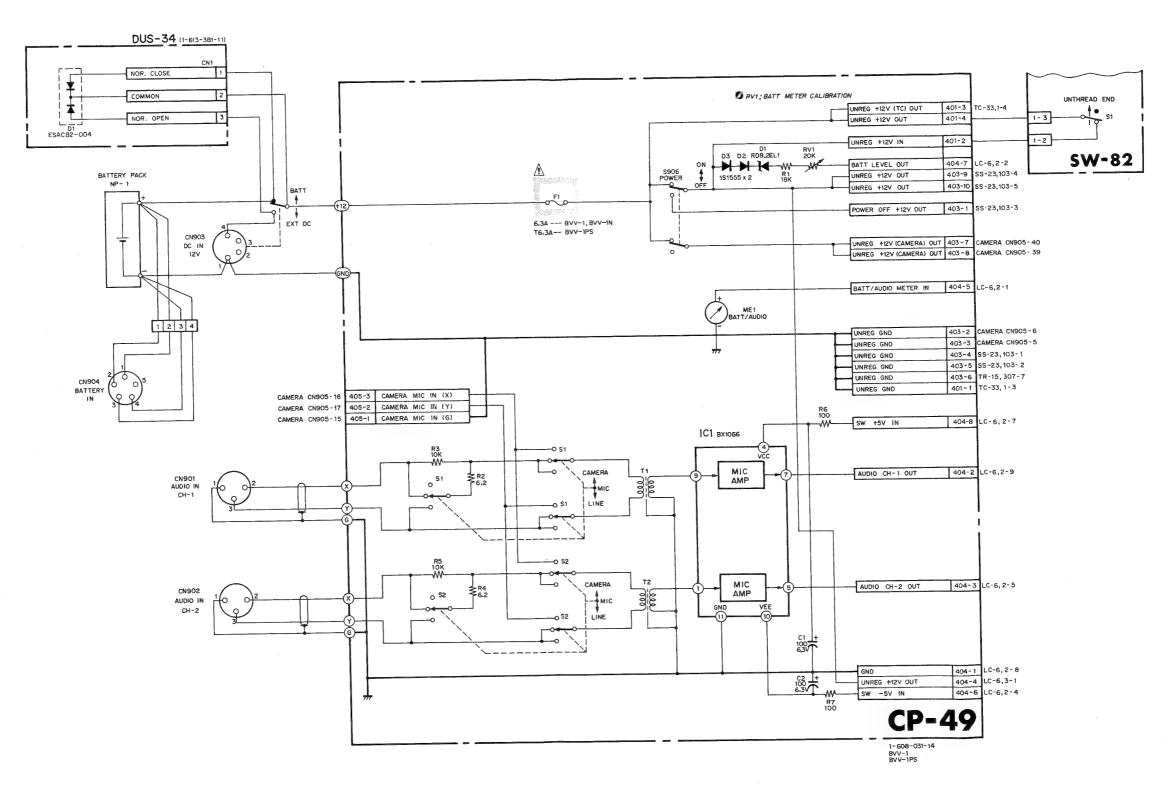


CP-49, DUS-34

CP-49 (CONNECTOR PANEL) DUS-34



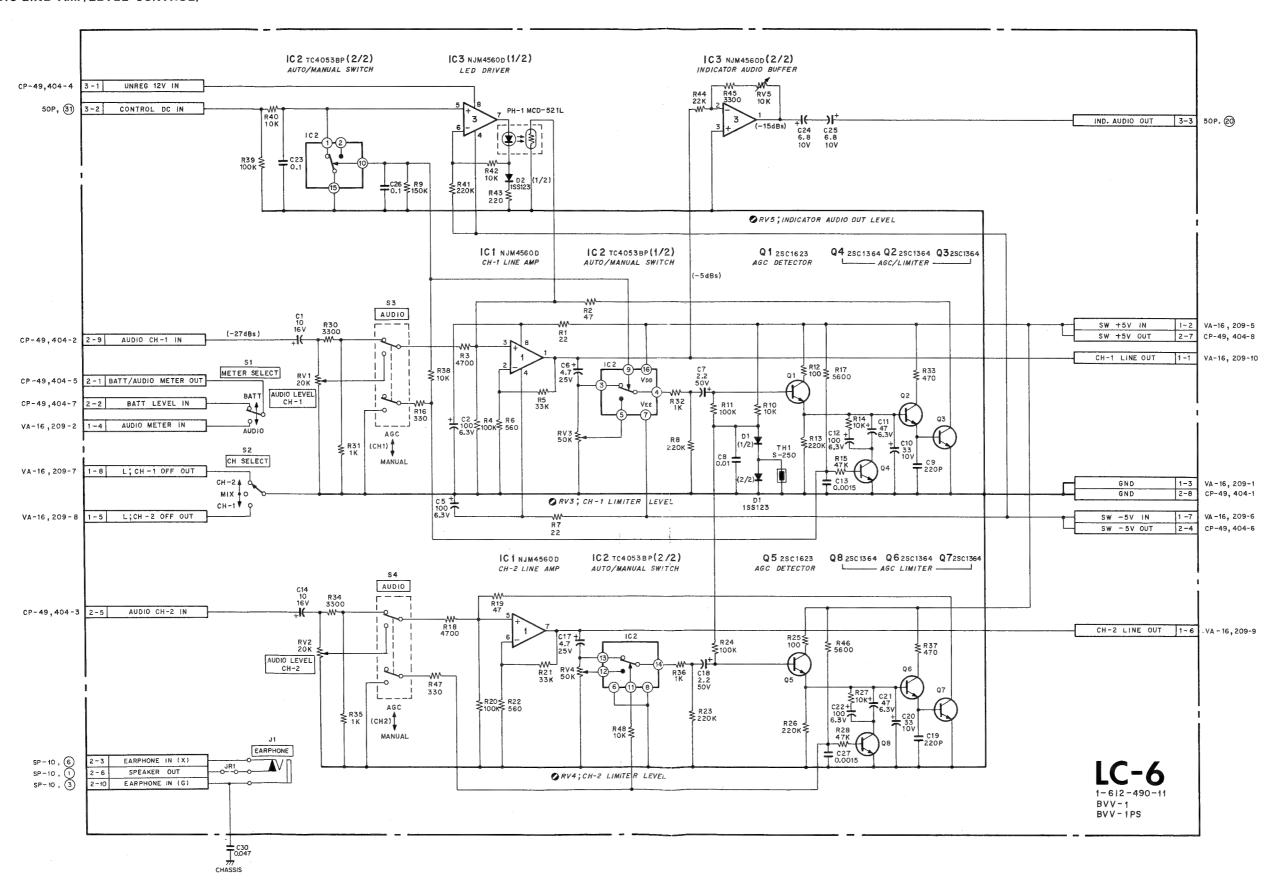
DUS -34
-SOLDERING SIDE1-615-381-11
8VV-1
8VV-1PS

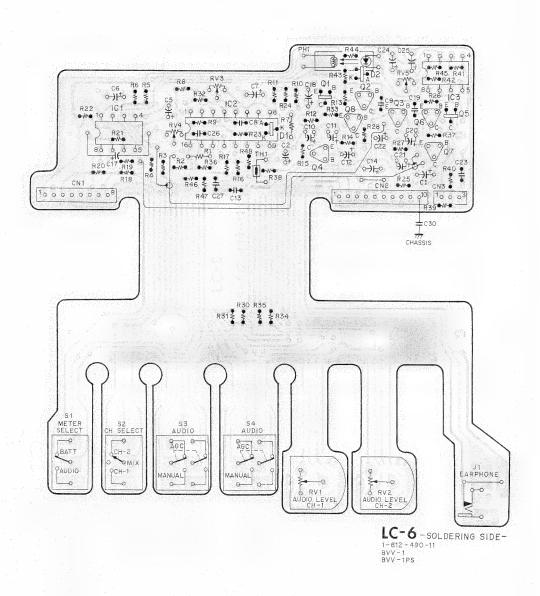


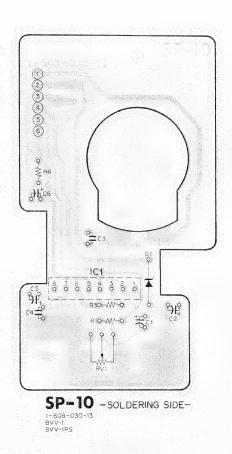
NOTE: The shaded and _______ -marked components are critical to

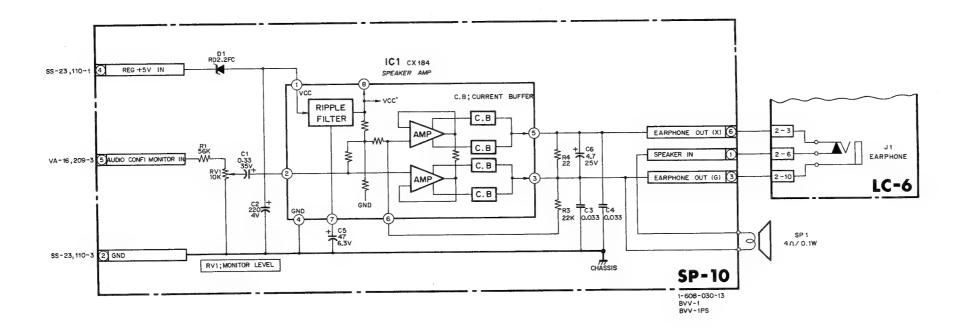
Replace only with same components as specified.

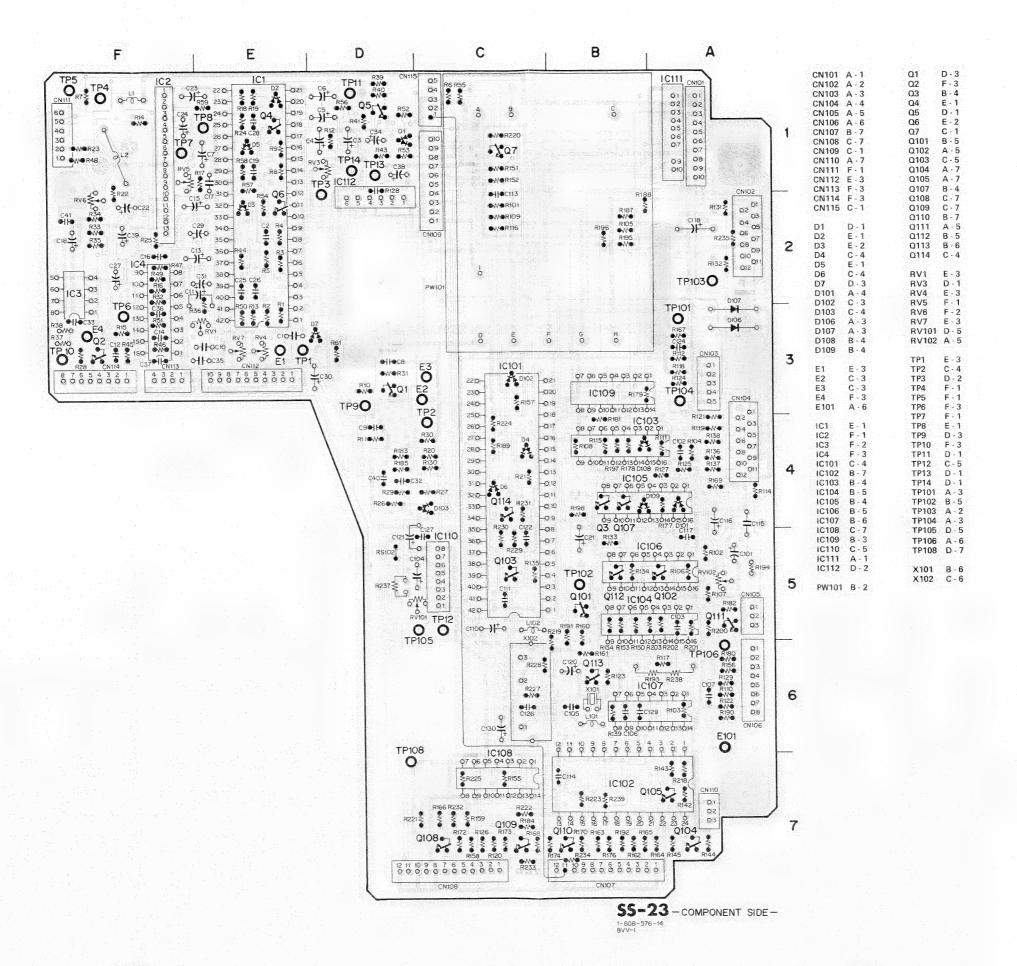
LC-6 (AUDIO LINE AMP/LEVEL CONTROL)



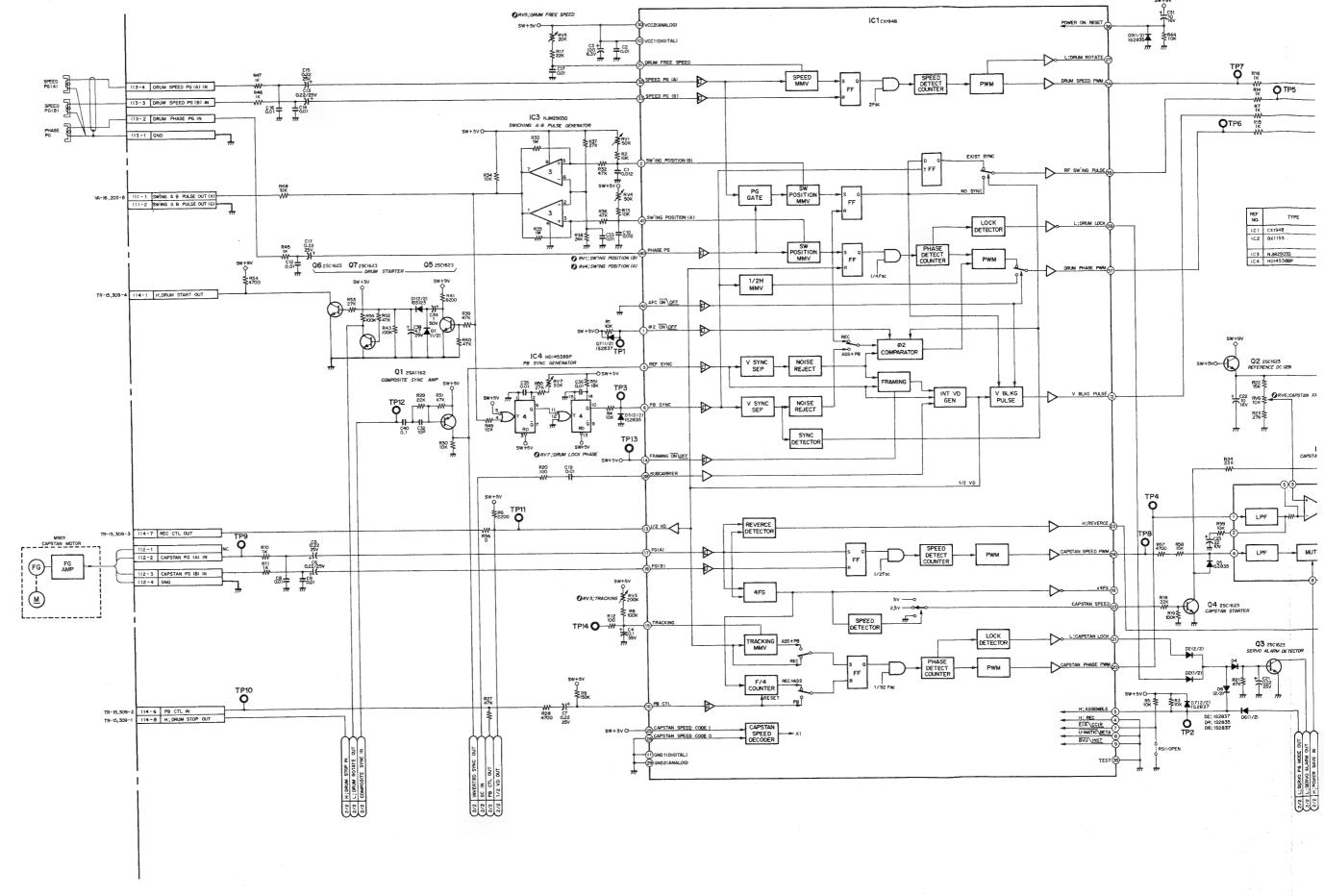




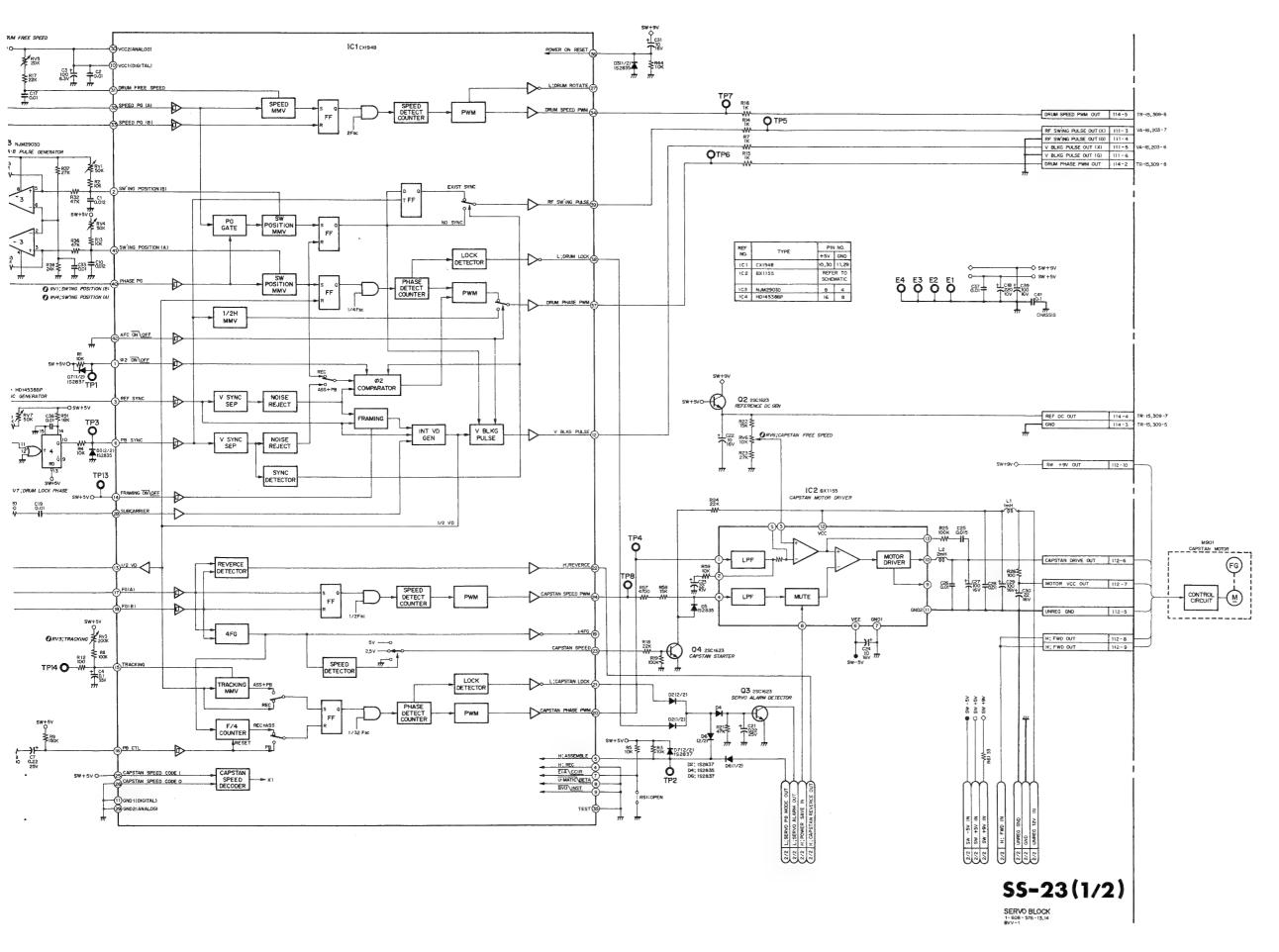




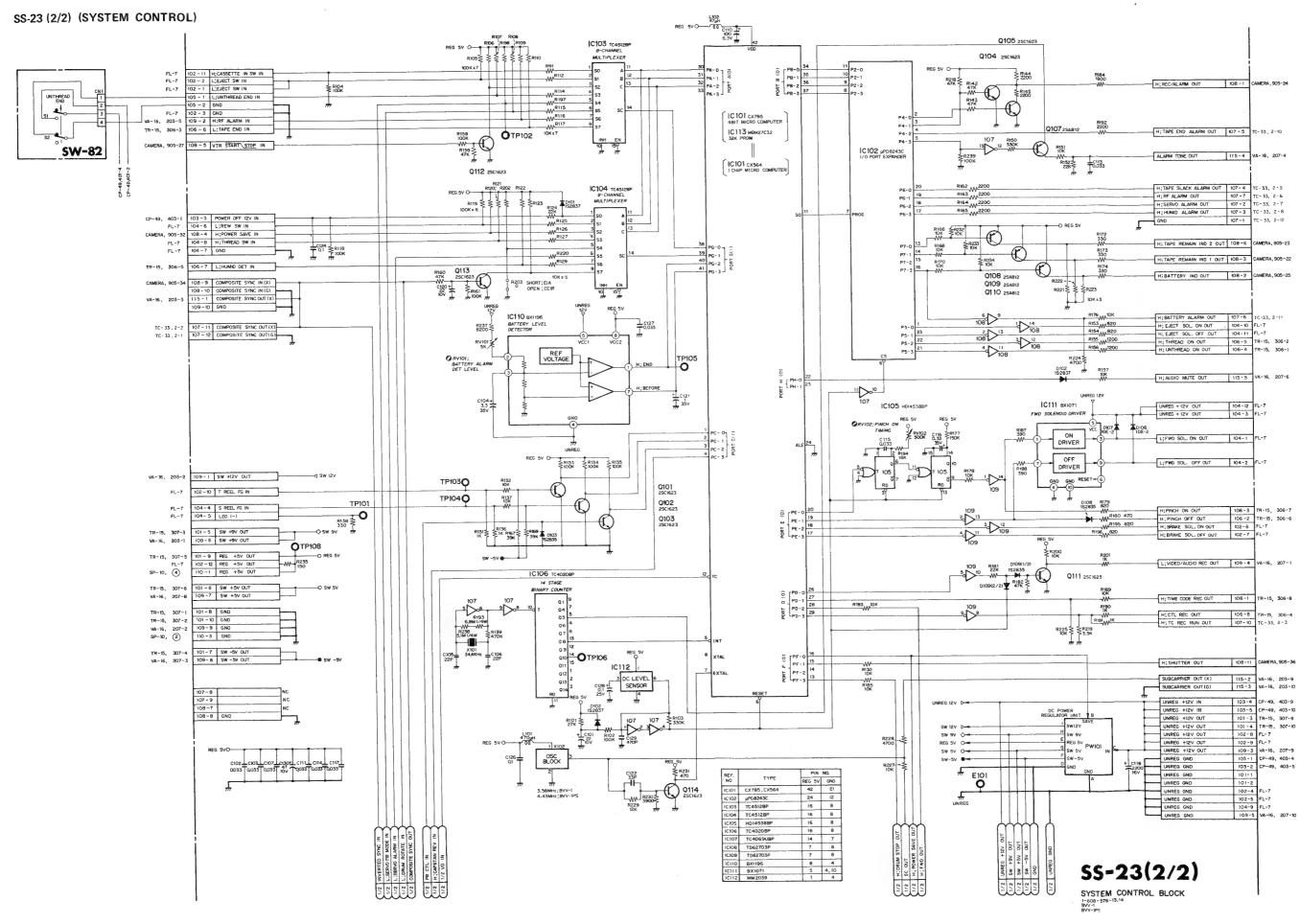
\$\$-23 (1/2) (SERVO SYSTEM)



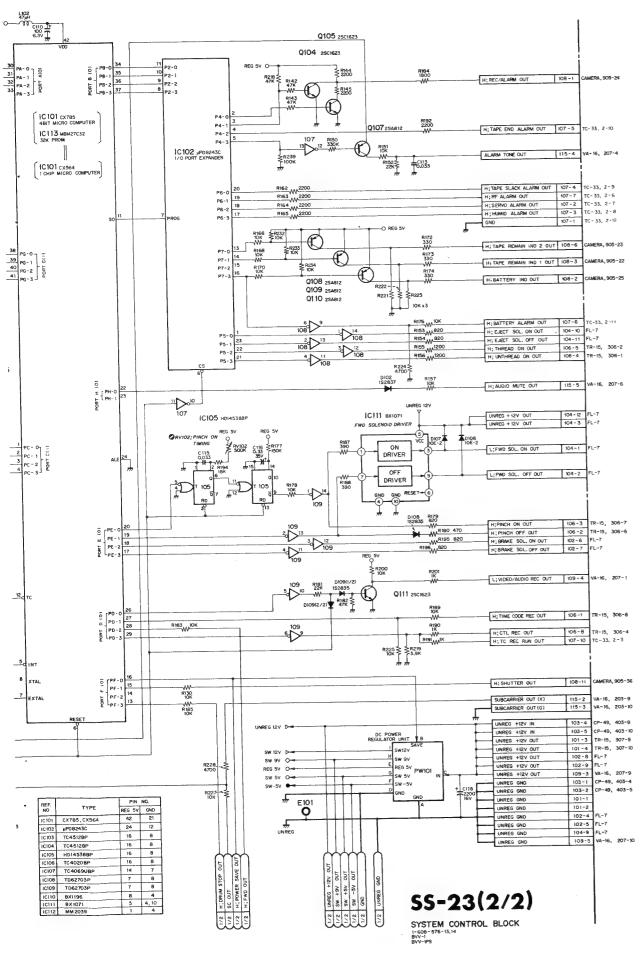
2)

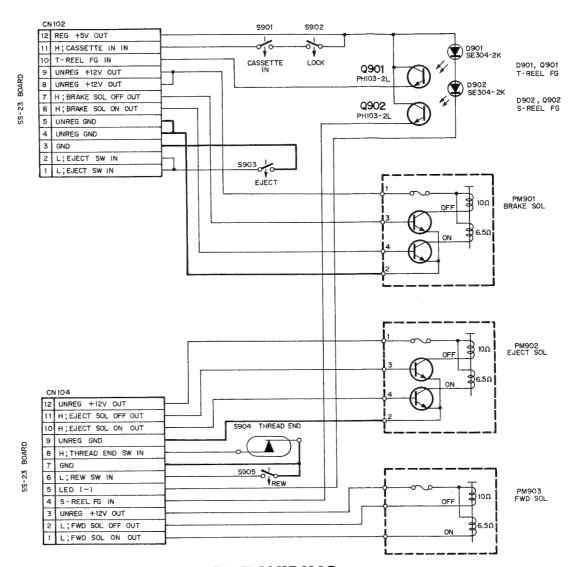


FL-7



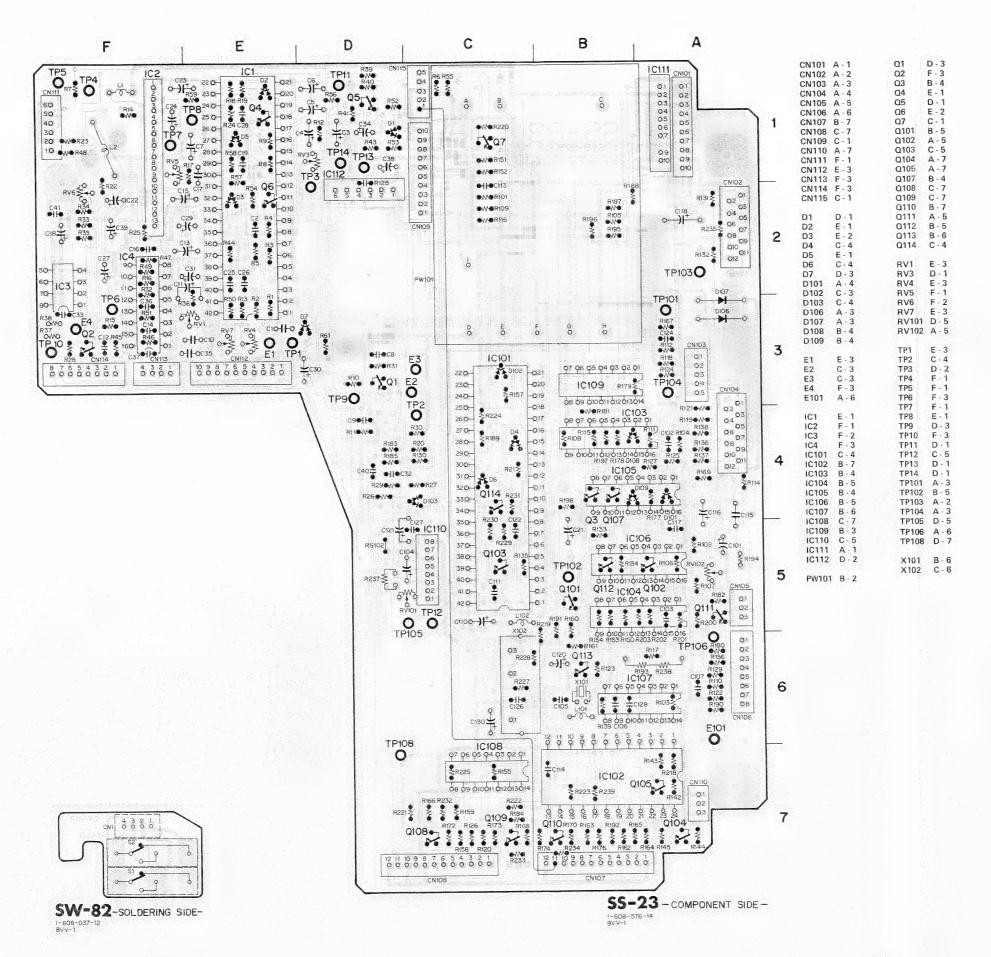


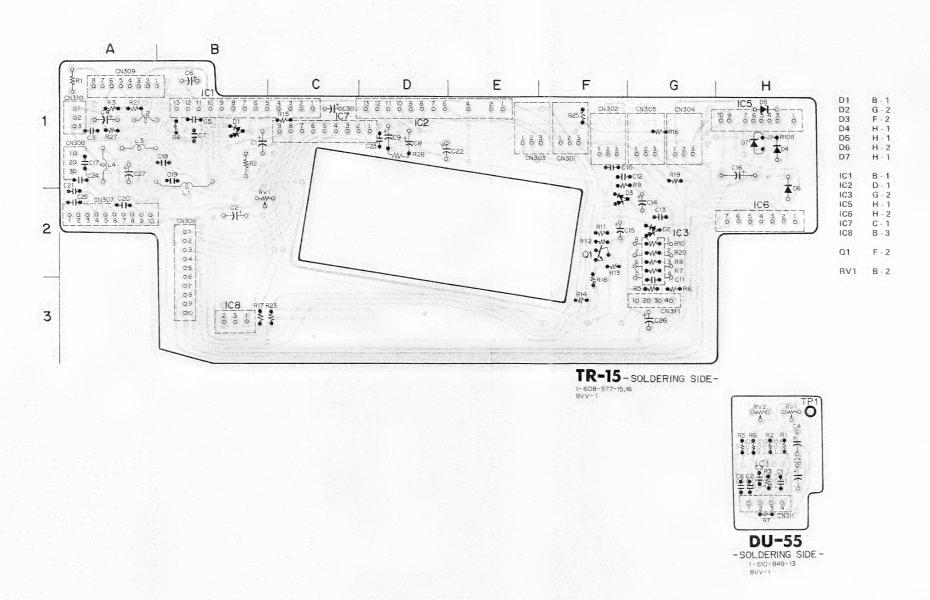


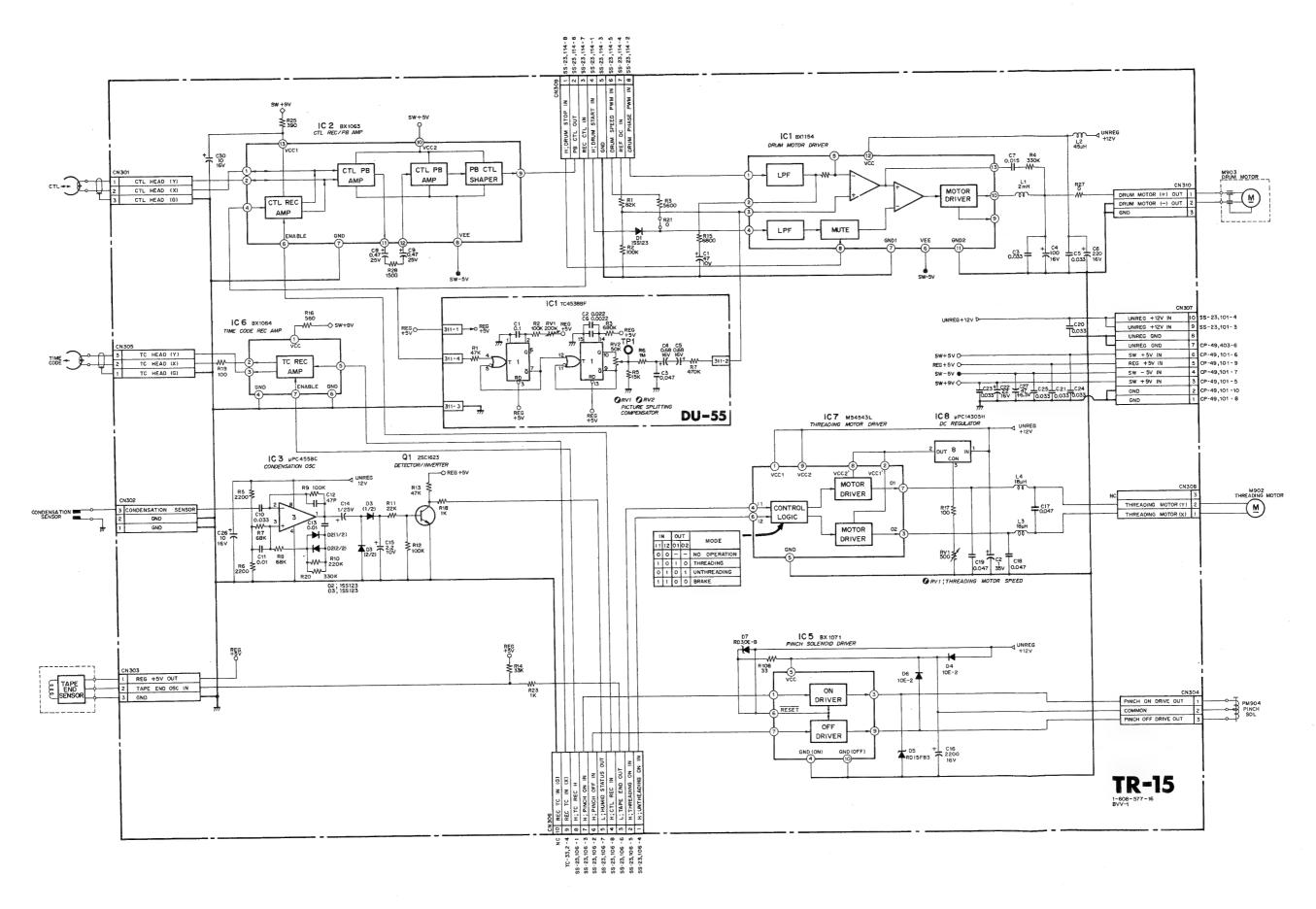


FL-7 WIRING

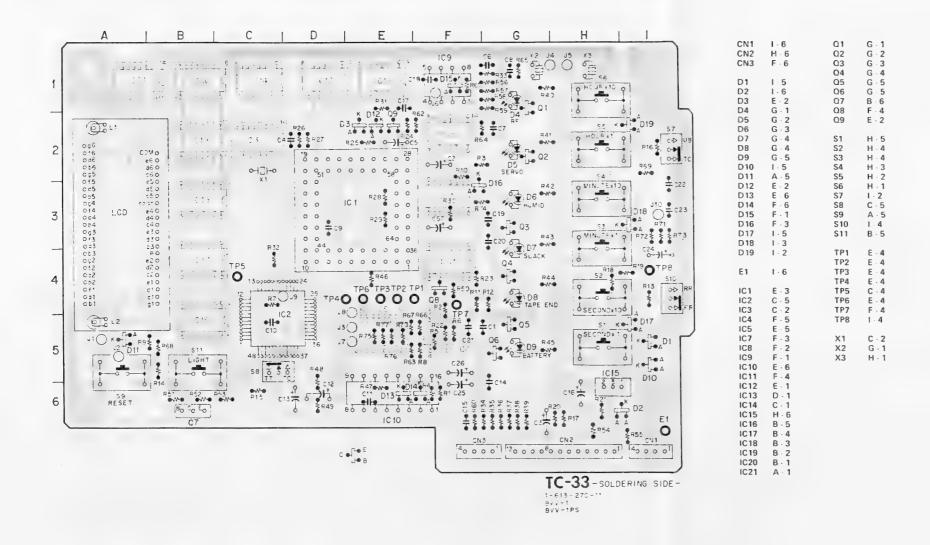
SS-23 (SYSTEM CONTROL) SW-82





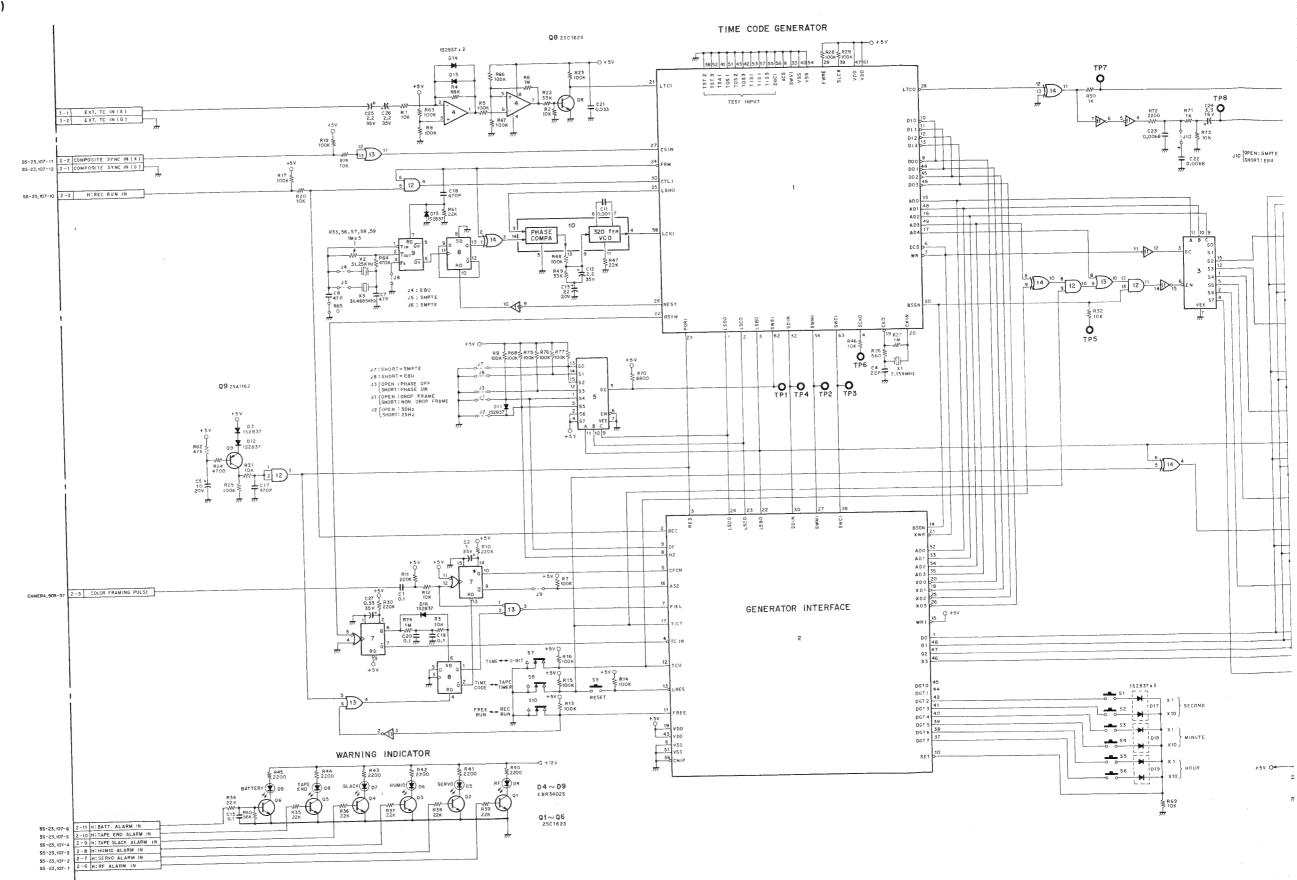


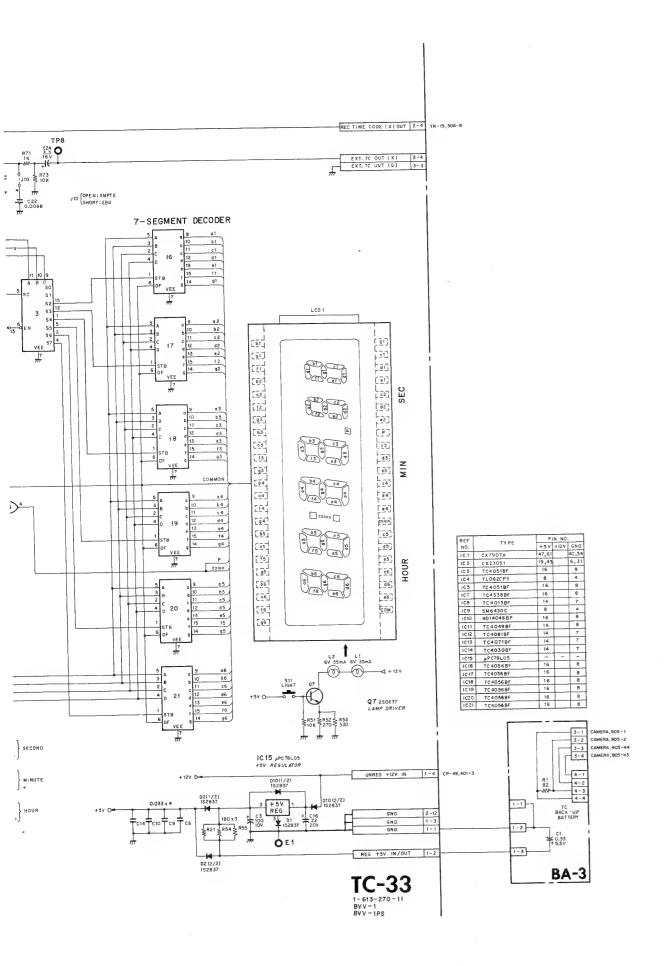
TC-33 (TIME CODE GENERATOR) BA-3

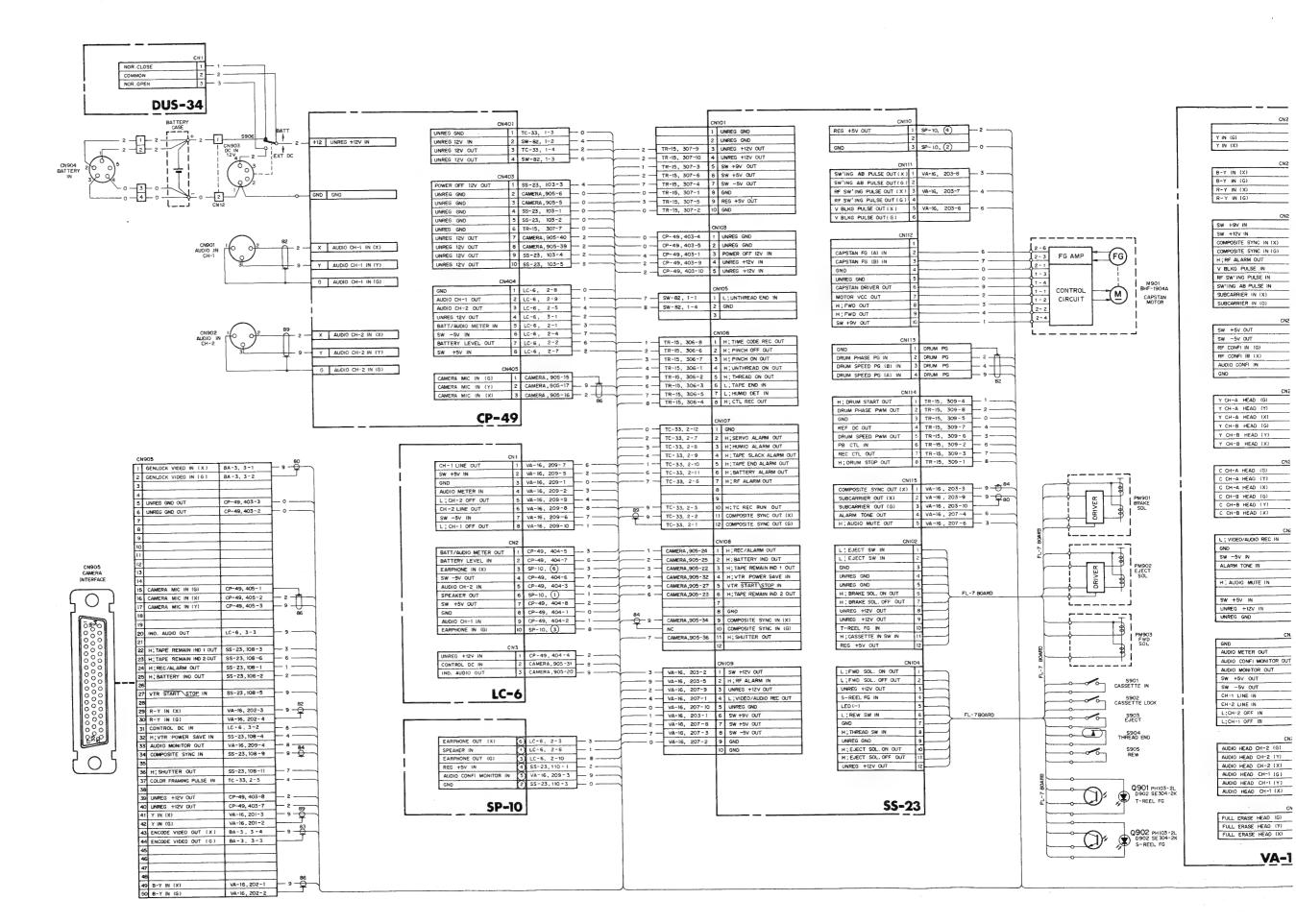


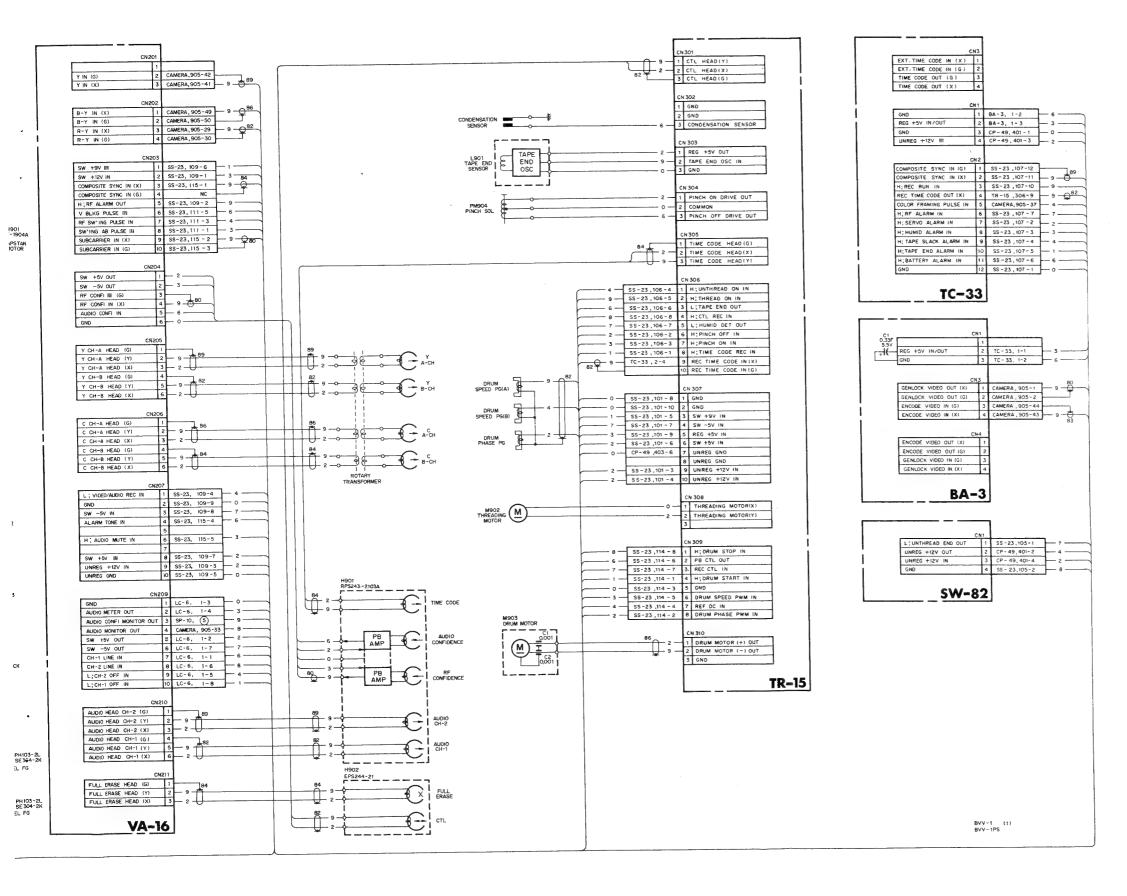


TC-33 (TIME CODE GENERATOR) BA-3









SECTION 16 SPARE PARTS AND FIXTURE

16-1. PARTS INFORMATION

Sony.

- Safety Related Component Warning
 Components identified by shading marked with on
 the schematic diagrams, exploded views and electrical
 spare parts list are critical to safe operation. Replace
 these components with Sony parts whose parts numbers appear as shown in this manual or in service
 bulletins and service manual supplements published by
- Replacement Parts supplied from Sony Parts Center will sometimes have different shape and outside view from the parts which actually in use. This is due to "accommodating the improved parts and/or engineering changes" or "standardization of genuine parts".
 - This manual's exploded views and electrical spare parts lists are indicating the parts numbers of "the standardized genuine parts at present".
 - Regarding engineering parts changes in our engineering department, refer Sony service bulletins and service manual supplements.
- 3. Printed Components in Bold-Face type on the exploded views and electrical spare parts list are normally stocked for replacement purposes. The remaining parts are not normally required for routine service work. Orders for parts not shown in Bold-Face type will be processed, but allow for additional delivery time.
- Item with no part number and/or no description are not stocked because they are seldom required for routine service.
- (T) after a spring description is shown on the exploded views in order to indicate the number of a spring turn required for the use.

(Example) Spring, tension (24T); This spring must be cut at its 24th turn for actual use.

16-2. EXPLODED VIEW

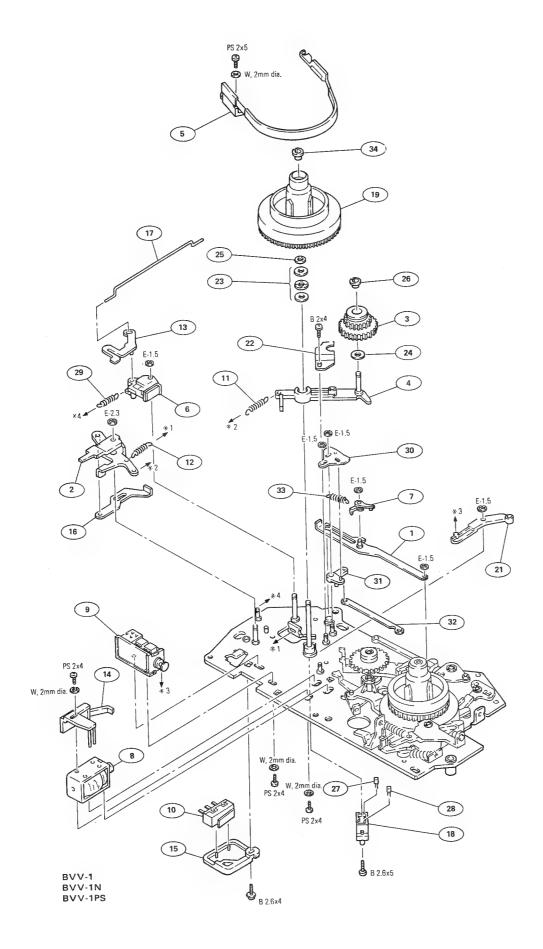
- Exploded views are composed of the following blocks
 - (1) Reel Chassis Block (1) (Left Side)
 - (2) Reel Chassis Block (2) (Right Side)
 - (3) Drum, Stationary Head, Tape Guide and Capstan Blocks
 - (4) Threading Ring, Motor and Switch Blocks
 - (5) Pinch Press Mechanism Block
 - (6) Ring Stopper Assembly Block
 - (7) Gear Assembly Block
 - (8) Reel Chassis Block (3) (Back side)
 - (9) Cassette-up Compartment Block
 - (10) Battery Case and P.C.B. (Printed Circuit Board)
 Blocks
 - (11) Ornamental Panel Block
 - (12) Side Panel Block (1)
 - (13) Side Panel Block (2)
 - (14) VSW (VTR Switch) Block

	HEXAGON SOCKET SCREW	HEXAGON SET SCREW	(-) SET SCREW FLAT POINT	() SET SCREW CONE POINT	
	⊕ = = =	⊕ []	⊕ · □ · □	⊕ · □	
2.6 × 3		7-621-734-09			
2.6 x 4	7-621-996-24	7-621-735-09			
2.6 × 5		7-621-736-09			
2.6 × 6	7-683-412-05			7-621-712-55	
2.6 x8	7-683-413-05			7-621-712-65	
2.6 × 10				7-621-712-75	
3 x 4		7-683-238-01			
3 x 5			7-683-175-01		
3 x 6	7-683-403-04		7-683-176-01	7-683-176-21	
3 x 8	7-683-404-04			7-683-177-21	
3 x 10	7-683-405-04			7-683-178-21	
3 x 12				7-683-179-21	

	PS	PSW	B (BZn-N)	B (Cr-N)	PTT	PTTWH
	₩==		-	-		
2.6 × 4	7-621-972-05		7-621-912-10	7-621-912-18		7-687-508-31
2.6 × 6	7-621-972-25	7-621-981-15	7-621-912-30	7-621-912-38		7-687-501-31
2.6 × 8	7-621-972-35	7-621-981-25	7-621-912-40	7-621-912-48		7-687-502-31
2.6 x 10	7-621-972-45	7-621-981-35	7-621-912-50	7-621-912-58		7-687-503-31
2.6 x 12	7-621-972-55	7-621-981-45	7-621-912-60	7-621-912-68		7-687-504-31
2.6 x 14	7-621-972-65	7-621-981-55	7-621-912-70	7-621-912-78		7-687-505-31
2.6 x 16	7-621-972-75	7-621-981-65	7-621-912-80	7-621-912-88		7-687-506-31
2.6 x 20	7-621-972-85	7-621-981-75	7-621-912-90	7-621-912-98		7-687-507-31
3 x 5	7-686-446-01					
3 × 6	7-686-447-01	7-686-527-01	7-686-624-09	7-686-624-04	7-687-411-31	7-687-510-31
3 x 8	7-686-448-01	7-686-528-01	7-686-625-09	7-686-625-04	7-687-412-31	7-687-511-31
3 x 10	7-686-449-01	7-686-529-01	7-686-626-09	7-686-626-04	7-687-413-31	7-687-512-31
3 x 12	7-686-450-01	7-686-530-01	7-686-627-09	7-686-627-04	7-687-414-31	7-687-513-31
3 x 16	7-686-452-01	7-686-532-01	7-686-629-09	7-686-629-04		
3 x 20	7-686-453-01	7-686-533-01	7-686-630-09	7-686-630-04		
3 x 25	7-686-454-01	7-686-534-01	7-686-631-09	7-686-631-04		
4 x 8	7-686-468-01	7-686-548-01	7-686-635-09	7-686-635-04		
4 x 12	7-686-470-01	7-686-550-01	7-686-637-09	7-686-637-04		
4 x 14	7-686-471-01		7-686-638-09	7-686-638-04		
4 x 16	7-686-472-01		7-686-639-09	7-686-639-04		
4 x 20	7-686-473-01		7-686-640-09	7-686-640-04		

	FLAT WASHER SMALL	FLAT WASHER MIDDLE	SPRING WASHER	TOOTHED WASHER TYPE B	HEXAGON NUT
	w. -⊙- 	w.	sw. - ⊕	LW ∰	N⊕
2.6 mm	7-688-002-01	7-688-002-12	7-623-207-22	7-623-421-07	7-622-207-05
3 mm	7-688-003-01	7-688-003-12	7-688-003-11	7-623-422-07	7-684-023-04
4 mm	7-688-004-01	7-688-004-12	7-623-210-22	7-623-423-07	7-684-024-04
5 mm	7-688-005-01	7-688-005-01	7-623-212-22		7-684-025-04

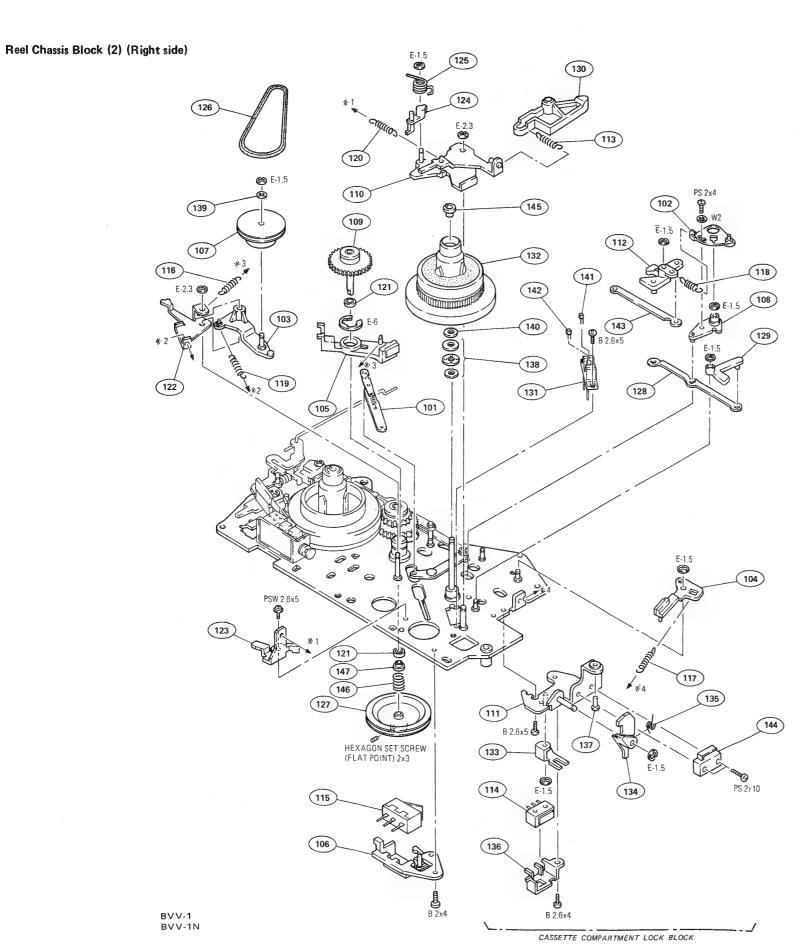
	STOP RING E TYPE E.
2	7-624-104-04
2.3	7-624-105-04
3	7-624-106-04
4	7-624-108-04
5	7-624-109-04
6	7-624-110-04



No.	Parts No.	Description
1	X-3676-058-0	LEVER (D) ASS'Y, T
2	X-3676-020-0	LEVER ASS'Y, REW
3	X-3676-027-0	PULLEY ASS'Y, REW
4	X-3676-045-0	ARM ASS'Y, REWIND
5	X-3676-049-0	BAND ASS'Y, T
_		
6	X-3676-056-0	BRAKE ASS'Y, S-SOFT
7	3-676-335-00	ARM, T
8	1-454-334-00	SOLENOID, PLUNGER
9	1-454-335-00	SOLENOID, PLUNGER
10	1-553-915-41	SWITCH, MICRO
11	3-140-263-XX	SPRING, TENSION (23T)
12	3-573-962-00	SPRING, TENSION
13	3-676-019-00	ARM, SOFT BRAKE
14	3-676-027-00	STOPPER, FWD
15	3-676-097-00	BRACKET, R-SW
16	3-676-100-00	PLATE, RELEASE, REW
17	3-676-165-00	JOINT, BRAKE, S SOFT
18	3-676-258-00	HOLDER, INTERRUPTER
19	3-676-261-03	TABLE, REEL, S
21	3-676-288-00	ARM (B), BRAKË
22	3-676-290-00	PLATE, ADJUSTMENT, REWIND
23	3-676-322-00	BEARING, THRUST
24	3-701-437-11	WASHER
25	3-701-439-11	WASHER
26	3-703-075-00	CAP 2, SHAFT
27	8-719-103-15	DIODE SE304-2K
28	8-729-101-13	TRANSISTOR PH103-2L
29	2-291-510-00	SPRING TENSION
30	3-676-336-00	PLATE, T
31	3-676-337-00	ARM, T DRIVING
32	3-676-338-00	JOINT, TD
33	3-491-096-11	SPRING, TENSION
34	3-703-074-00	CAP 3, SHAFT

- Parts printed in Bold-Face type are normally stocked for replacement purposes. The remaining parts shown in this manual are not normally required for routine service work. Orders for parts not shown in Bold-Face type will be processed, but allow for additional delivery time.
- Item with no part number and/or no description are not stocked because they are seldom required for routine service.

REEL CHASSIS (2) REEL CHASSIS (2)



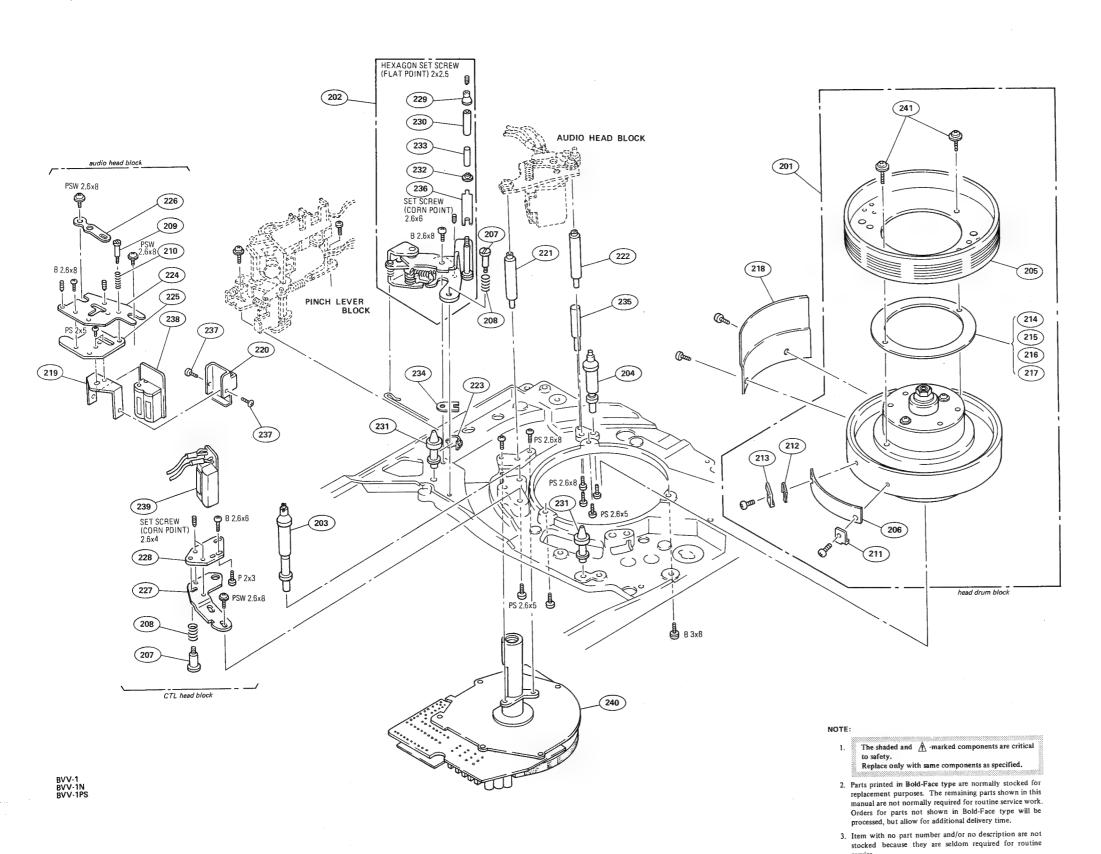
NOTE:

- The shaded and A-marked components are criticates to safety.
 Replace only with same components as specified.
- Parts printed in Bold-Face type are normally stocked for replacement purposes. The remaining parts shown in this manual are not normally required for routine service work. Orders for parts not shown in Bold-Face type will be processed, but allow for additional delivery time.
- Item with no part number and/or no description are not stocked because they are seldom required for routine service.

No.	Parts No.	Description
101	X-3676-060-0	LEVER (AB) ASS'Y, T
102	X-3676-004-0	PLATE ASS'Y, ADJUSTMENT, ARM
103	X-3676-019-0	ARM ASS'Y, FWD
104	X-3676-021-0	BRAKE ASS'Y, SOFT, T
105	X-3676-022-0	BRAKE ASS'Y
106	X-3676-023-0	BRACKET ASS'Y, E-SW
107	X-3676-026-0	PULLEY ASS'Y, FWD
108	X-3676-037-0	ARM ASS'Y, ST RELAY
109	X-3676-040-0	GEAR ASS'Y, RELAY
110	X-3676-041-0	LEVER ASS'Y, EJECT
111	X-3676-043-4	BRACKET ASS'Y, LOCK ARM
112	3-676-340-00	STOPPER (B), REW
113	3-676-328-00	SPRING, TENSION
114	1-553-915-31	SWITCH, MICRO
115	1-553-915-41	SWITCH, MICRO
116	3-508-108-XX	SPRING, TENSION (17T)
117	3-568-321-00	SPRING, TENSION
118	3-542-475-00	SPRING, TENSION
119	3-564-107-00	SPRING, TENSION
120	3-573-962-00	SPRING, TENSION
121	3-669-443-00	BEARING, BALL (NO FLANGE)
122	3-676-029-00	PLATE, FWD
123	3-676-101-00	RETAINER, ARM
124	3-676-102-00	ARM (A), E-SW
125	3-676-105-00	SPRING, TORSION
126	3-676-175-00	BELT, FWD
127	3-676-217-02	PULLEY, MIDWAY
128	3-676-223-00	JOINT, ER
129	3-676-234-00	STOPPER, EJ
130	3-676-249-00	ARM, EJECT
131	3-676-258-00	HOLDER, INTERRUPTER
132	X-3676-074-0	TABLE, REEL, T
133	3-676-272-02	LEVER, LOCK SWITCH
134	3-676-273-00	ARM, LOCK, CASSETTE COMPARTMENT
135	3-676-274-00	SPRING
136	3-676-275-00	HOLDER, M-SW
137	3-676-277-00	SHAFT, CASSETTE-IN
138	3-676-322-00	BEARING, THRUST
139	3-701-437-11	WASHER, POLY 2MM DIA., 0.25T
140	3-701-439-11	WASHER, POLY 3MM DIA., 0.25T
141	0.740.400.47	DIODE GEOGRAM
141	8-719-103-15	DIODE SE304-2K
142 143	8-729-101-13 3-676-338-00	TRANSISTOR PH103-2L
143	1-553-650-11	JOINT, TD
145	3-703-074-00	SWITCH, MICRO CAP 3, SHAFT
1-10	3-703-074-00	OAL U, SHAFT
146	3-637-331-00	SPRING, COMPRESSION

3-676-385-00 RETAINER, BEARING

Drum, Stationary Head, Tape Guide and Capstan Blocks



		•
201 202 203 204 205	A-6050-165-A A-6742-044-A A-6746-023-A A-6746-024-A A-6762-101-A	DRUM ASS'Y, DSH-28A-R TENSION REGULATOR ASS'Y GUIDE ASS'Y, ENTRANCE GUIDE ASS'Y, EXIT UPPER DRUM ASS'Y, DSR-28-R
206 207 208 209 210	1-586-633-00 3-145-535-01 3-669-317-00 3-643-451-00 3-653-350-00	DETECTOR, DEW SCREW, HEAD SPRING, COMPRESSION SCREW, AZIMUTH ADJUSTMENT SPRING, COMPRESSION
211 212 213 214 215	3-655-631-00 3-675-701-00 3-675-702-00 3-675-708-01 3-675-708-11	TERMINAL, GROUND TERMINAL BOARD WASHER, INSULATING SPACER, FLANGE (0.01T) SPACER, FLANGE (0.03T)
216 217 218 219 220	3-675-708-21 3-675-708-31 3-675-711-00 3-676-382-00 3-676-011-00	SPACER, FLANGE (0.05T) SPACER, FLANGE (0.1T) PROTECTOR, DRUM BRACKET, CASE CASE (R), SHIELD
221 222	3-676-013-00 3-676-014-02	SUPPORT (A), AU HEAD SUPPORT (B), AU HEAD (NOTE: When this part is replaced in the up to S/N 10835 (U/C), 10700 (J), tighten this part with PS 2.6x8 screw, never use PS 2.6x5 screw.)
223 224 225	3-676-018-00 3-676-077-00 3-676-078-00	STOPPER, TENSION REGULATOR BRACKET (A), A HEAD BRACKET (B), A HEAD
226 227 228 229 230	3-676-079-00 3-676-090-00 3-676-091-00 3-676-136-04 3-676-139-00	ADJUSTOR, X BRACKET (A), CTL HEAD BRACKET (B), CTL HEAD FLANGE, T.R ROLLER, T.R
231 232 233 234 235	3-676-177-00 3-676-206-00 3-676-207-00 3-676-208-00 3-676-232-02	SHAFT, CG FLANGE, LOWER, TR SLEEVE, T ROLLER PLATE, SINK GUIDE, DUMMY (NOTE: When this part is replaced in the up to S/N 10835 (U/C), 10700 (J), tighten this part with PS 2.6x8 screw, never use PS 2.6x5 screw.)
236 237 238 239 240	3-676-307-00 3-703-502-01 8-825-554-11 8-825-554-31 8-838-036-01	SPRING, LEAF, T.R ROLLER SCREW HEAD, AUDIO (PRP244-2103A) HEAD, CTL (2RP244-21) MOTOR, DC (BHF-1904A)

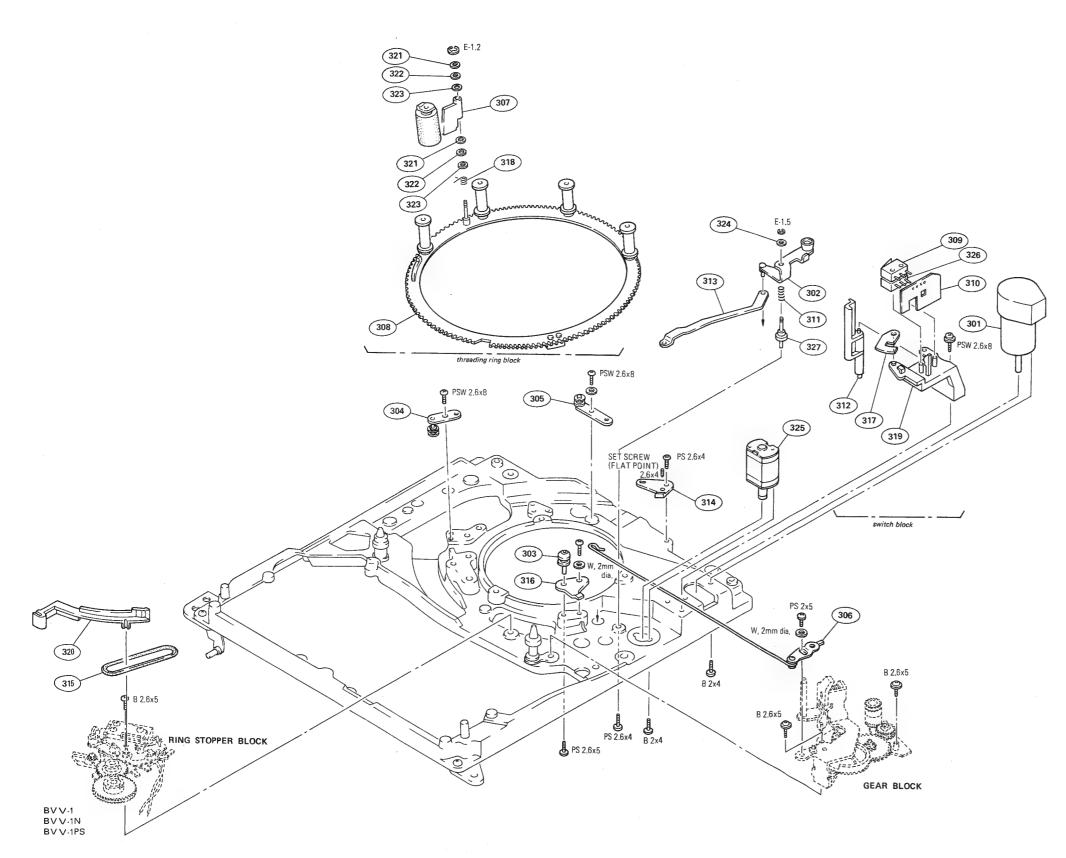
Parts No.

Description

3-675-740-00

SCREW 2.6x8

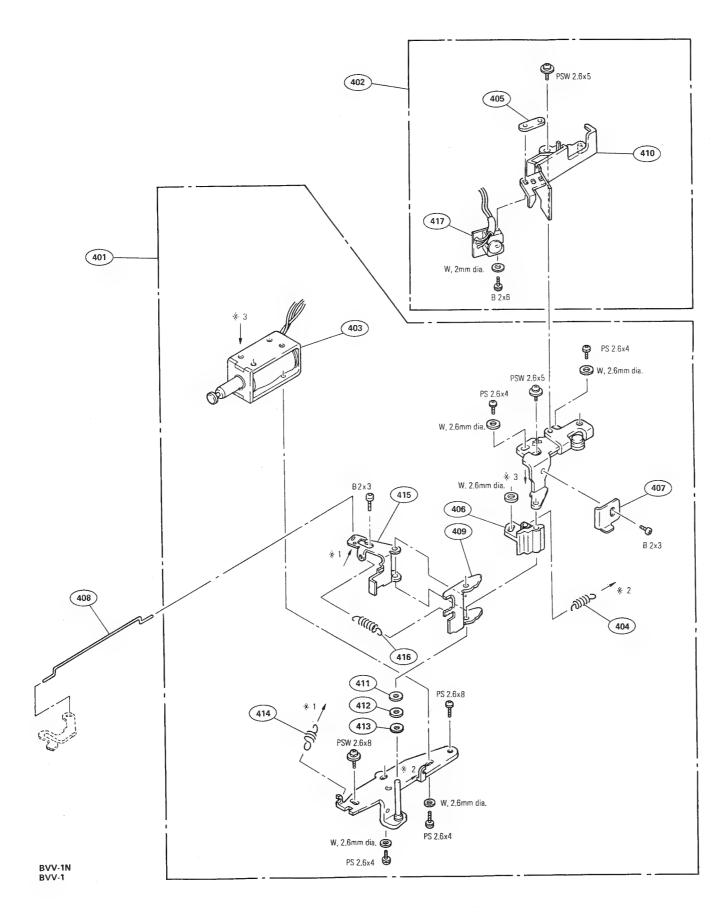
Threading Ring, Motor and Switch Blocks



No.	Parts No.	Description
301 302	A-6737-112-A X-3676-003-0	MOTOR ASS'Y, DRUM ARM ASS'Y
303	X-3676-006-0	SHAFT ASS'Y, RING ROLLER
304	X-3676-007-0	PLATE ASS'Y, RG
305	X-3676-008-0	PLATE ASS'Y, ADJUSTMENT, ROLLER
306	X-3676-016-0	ROD ASS'Y, PULL
307	X-3676-031-0	PINCH ARM ASS'Y
308	X-3676-055-3	RING SUB ASS'Y, THREADING
309	1-553-650-11	SWITCH, MICRO
310	1-608-037-00	PRINTED CIRCUIT BOARD, SW-82
311	3-573-964-00	SPRING, COMPRESSION
312	3-676-012-00	LEVER, SWITCH, UNTHREADING
313	3-676-021-00	JOINT, ARM, UNTHREADING
314	3-676-034-00	STOPPER (B), RING
315	3-676-178-00	BELT, EJ
316	3-676-181-00	STOPPER (A), RING
317	3-676-301-00	PLATE, CORRECTION, SLANT GUIDE
318	3-676-304-00	SPRING
319	3-676-311-00	BASE, UNTHREADING SWITCH
320	3-676-312-02	GUIDE, PINCH ROLLER
321	3-701-436-01	WASHER, POLY 1.6MM DIA., 0.13T
322	3-701-436-11	WASHER, POLY 1.6MM DIA., 0.25T
323	3-701-436-21	WASHER, POLY 1.6MM DIA., 0.5T
324	3-701-437-21	WASHER, POLY 2MM DIA., 0.5T
325	8-835-079-01	MOTOR, LOADING (DNR-5900A)
326	1-553-577-00	SWITCH, MICRO
327	3-676-228-00	SHAFT, ARM, UNTHREADING

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Pinch Press Mechanism Block

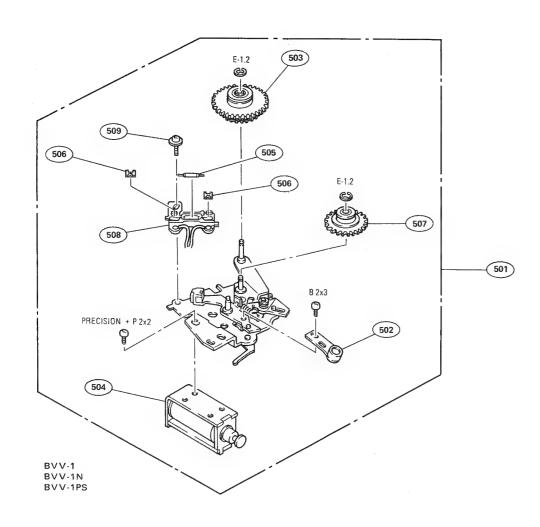


No.	Parts No.	Description
401 402 403 404 405	A-6749-076-E A-6765-043-A 1-454-340-00 3-639-181-00 3-646-476-00	PRESS ASS'Y, PINCH END SENSOR ASS'Y SOLENOID, PLUNGER SPRING, TENSION NUT, PLATE
406 407 408 409 410	3-676-094-03 3-676-095-00 3-676-165-00 3-676-246-00 3-676-250-00	STOPPER, TAPE RETAINER, ARM JOINT, BRAKE, S SOFT LEVER (A), PINCH PRESS BRACKET, END SENSOR
411 412 413 414	3-701-437-01 3-701-437-11 3-701-437-21 4-847-057-00	WASHER, POLY 2MM DIA., 0.13T WASHER, POLY 2MM DIA., 0.25T WASHER, POLY 2MM DIA., 0.5T SPRING, TENSION U/C: UP TO S/N 10805 J: UP TO S/N 10400
	3-567-110-00	SPRING, TENSION U/C: S/N 10806 AND LATER J: S/N 10401 AND LATER
415	3-676-263-03	LEVER (B), PINCH PRESS (NOTE: When this part is replaced in the up to S/N 10805 (U/C), 10400 please replace the 3-567-110-00 at the same time.)
416 417	3-678-774-00 1-464-227-00	SPRING, TENSION SENSOR, T COIL U/C: UP TO S/N 10690 J: UP TO S/N 10340
	1-464-267-00	SENSOR, T COIL U/C: S/N 10691 AND LATER J: S/N 10341 AND LATER

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Ring Stopper Assembly Block

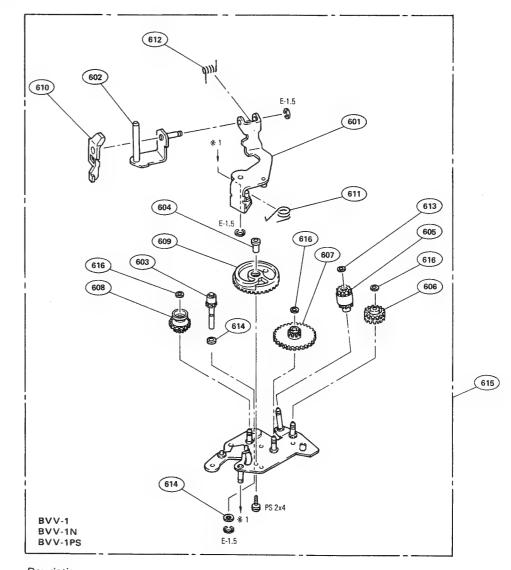


No.	Parts No.	Description
501	A-6747-223-A	STOPPER ASS'Y, RING
502	X-3676-029-0	ARM (B) ASS'Y, STOPPER
503	X-3676-044-0	IDLER ASS'Y, EJECT
504	1-454-335-00	SOLENOID, PLUNGER
505	1-554-251-00	SWITCH, REED
506	3-676-062-00	TERMINAL, SWITCH
507	3-676-163-00	PULLEY, EJ RELAY
508	3-676-255-00	HOLDER, SWITCH
509	3-703-502-22	SCREW

NOTE:

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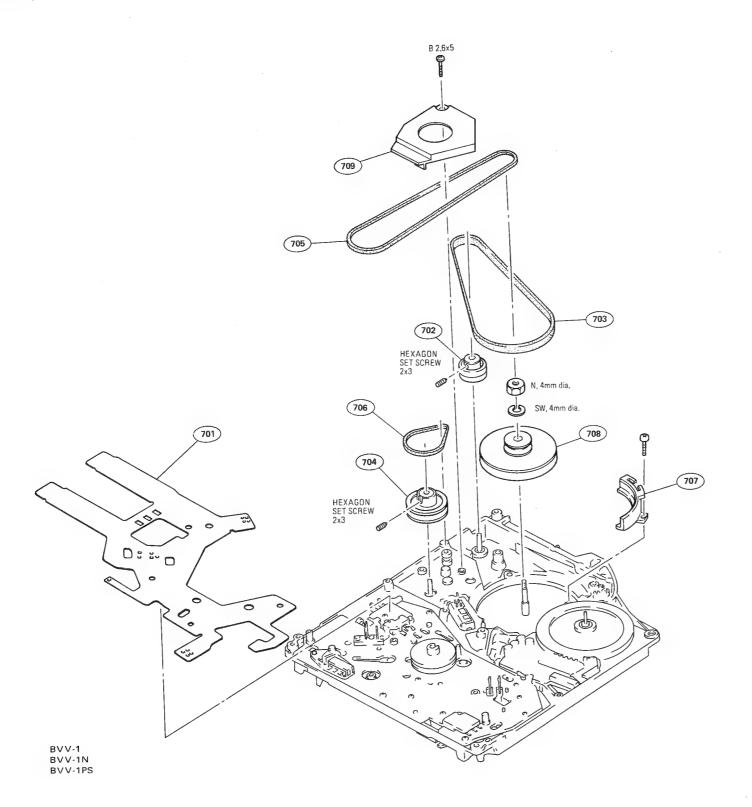
Gear Assembly Block



No.	Parts No.	Description
601	X-3676-038-2	ARM ASS'Y, PULL
602	X-3676-039-0	LINK ASS'Y, SLANT
603	X-3676-050-0	GEAR ASS'Y, MOTHER
604	3-676-133-00	SHAFT, CAM
605	3-676-156-00	GEAR, RING DRIVE
606	3-676-157-00	GEAR, TRANSFER
607	3-676-160-00	GEAR, DECELERATION
608	3-676-167-00	PULLEY, EJECT
609	3-676-260-00	CAM, DRAWER
610	3-676-306-03	TRAVELER, TAPE
611	3-676-308-00	SPRING
612	3-676-309-03	SPRING
613	3-701-436-11	WASHER, POLY 1.6MM DIA., 0.25T
614	3-701-437-11	WASHER, POLY 2MM DIA., 0.25T
615	A-6750-138-C	GEAR BLOCK ASS'Y
616	3-676-387-00	WASHER, POLY, 1.6MM DIA.

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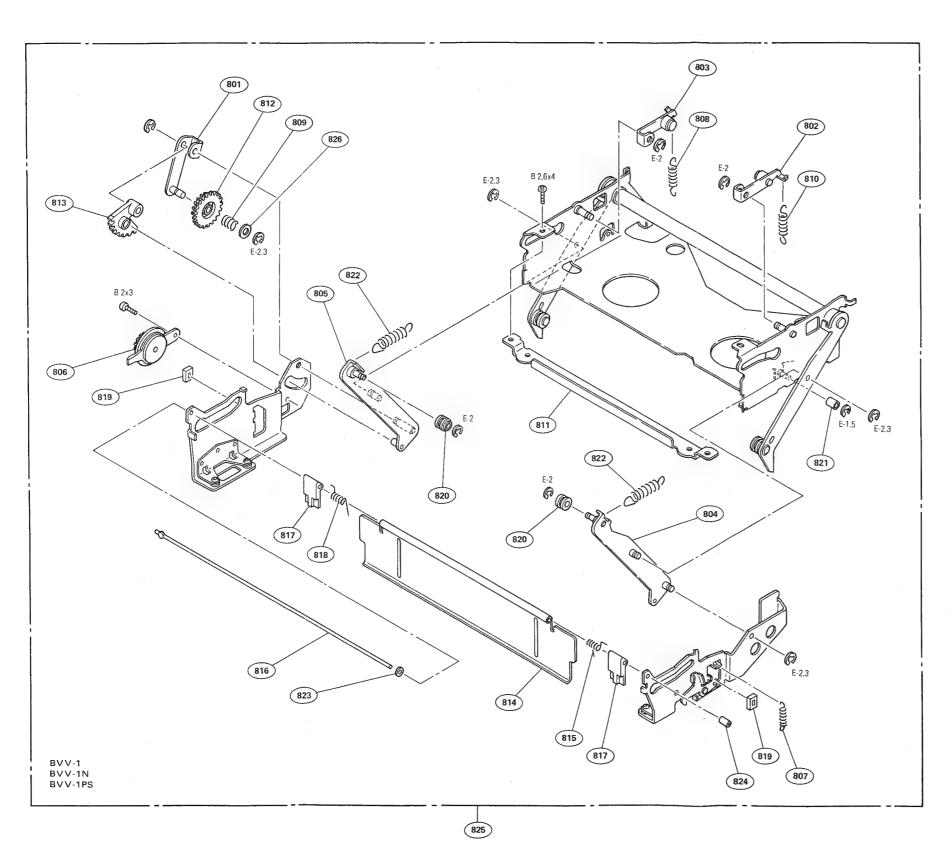


No.	Parts No.	Description
701	1-608-028-00	PRINTED CIRCUIT BOARD, FL-7
702	3-676-035-00	PULLEY, D MOTOR
703	3-676-059-00	BELT, DRUM
704	3-676-166-00	PULLEY, DECELERATION
705	3-676-176-00	BELT, MECHANICAL
706	3-676-303-00	BELT, T.H MOTOR
707	3-675-716-00	GUARD, DRUM
708	3-675-703-00	PULLEY, DRUM
709	3-676-381-00	COVER, T PULLEY

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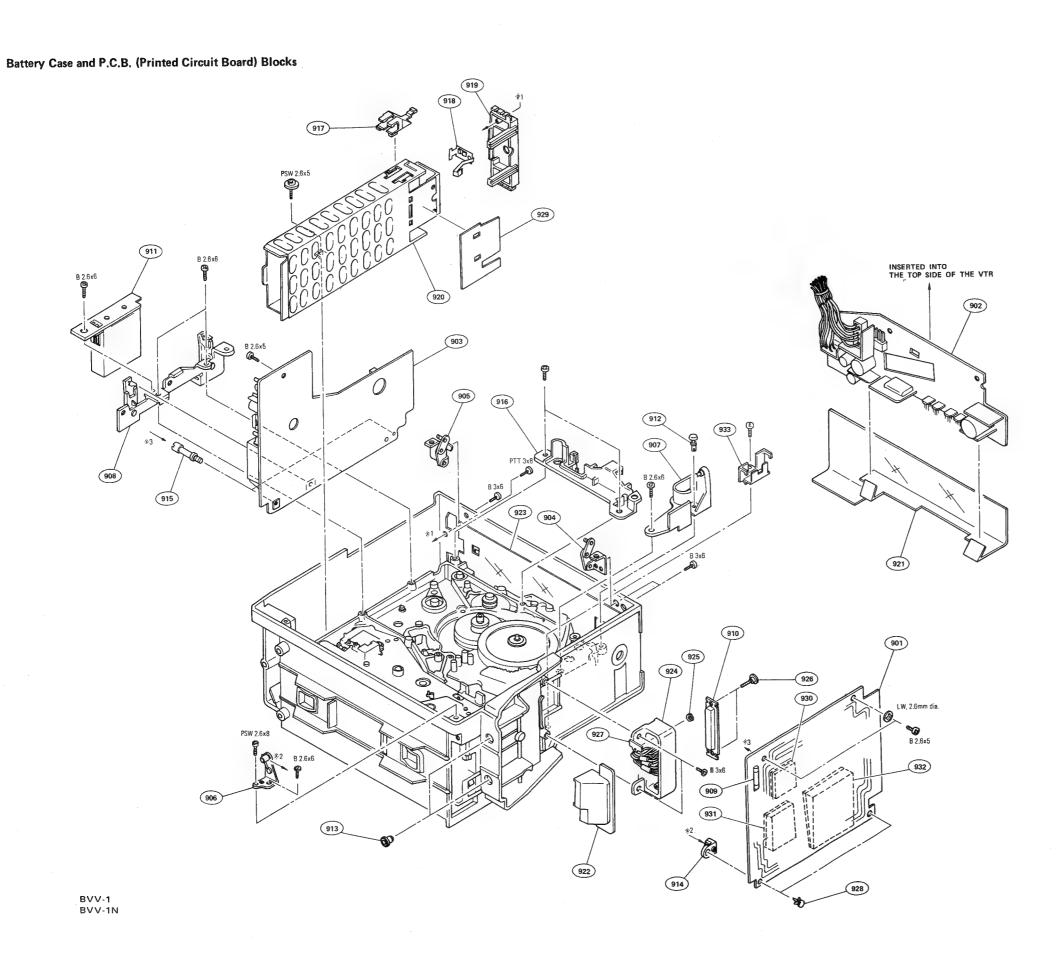
Cassette-up Compartment Block



No.	Parts No.	Description
801	X-3676-001-0	LEVER SUB ASS'Y, GEAR
802	X-3676-009-0	LEVER (RIGHT) ASS'Y, RETAINER
803	X-3676-010-0	LEVER (LEFT) ASS'Y, RETAINER
804	X-3676-013-0	ARM (A) (RIGHT) SUB ASS'Y
805	X-3676-014-0	ARM (A) (LEFT) SUB ASS'Y
806	X-3676-024-2	DAMPER ASS'Y
807	3-542-475-00	SPRING, TENSION
808	3-567-029-00	SPRING, TENSION
809	3-567-100-00	SPRING, COMPRESSION
810	3-670-169-00	SPRING, TENSION
811	3-676-049-00	STAY, CASSETTE COMPARTMENT
812	3-676-054-00	GEAR, SPEED
813	3-676-055-00	LEVER, SPEED
814	3-676-064-00	SHUTTER
815	3-676-065-00	SPRING, TORSION
816	3-676-067-00	SHAFT, SHUTTER
817	3-676-068-00	GUIDE, CASSETTE
818	3-676-069-00	SPRING, TORSION
819	3-676-143-00	STOPPER, ARM
820	3-676-154-00	ROLLER
821	3-676-221-00	ROLLER, LOCK
822	3-678-787-00	SPRING, TENSION
823	3-701-436-11	WASHER, POLY 1.6MM DIA., 0.25T
824	4-866-397-00	CUSHION, LED
825	A-6751-150-C	CASSETTE COMPARTMENT ASS'Y
826	3-663-748-00	WASHER, SUS

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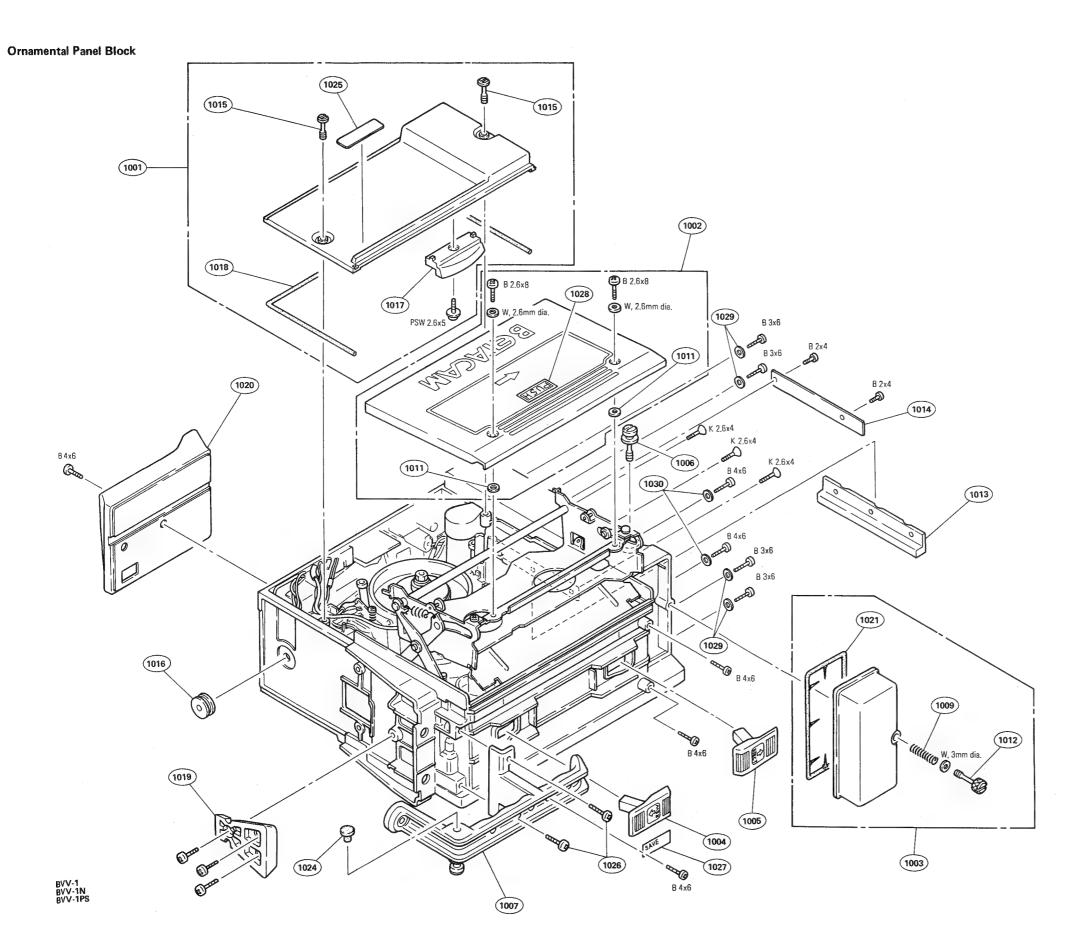
BATTERY CASE, P.C.B. BATTERY CASE, P.C.B.



No.	Parts No.	Description
901 902	A-6759-115-A A-6715-149-A	MOUNTED CIRCUIT BOARD, VA-19 MOUNTED CIRCUIT BOARD, TR-19 U/C: UPTO S/N 10690
	A-6715-169-C	J: UP TO S/N 10340 MOUNTED CIRCUIT BOARD, TR-19 U/C: S/N 10691 AND LATER J: S/N 10341 AND LATER
903	A-6717-299-A	MOUNTED CIRCUIT BOARD, SS-23
904	X-3676-017-0	HINGE (LEFT) ASS'Y
904	X-3676-018-0	HINGE (RIGHT) ASS'Y
905	X-3070-010-0	THINGE (TIGHT) ASS T
906	X-3676-046-2	HOĽDER (A) ASS'Y, PC BOARD
907	X-3676-047-0	HOLDER (C) ASS'Y, PC BOARD
908	X-3676-048-0	HOLDER (E) ASS'Y, PC BOARD
909	1-548-119-00	HOURS METER
910	1-562-083-00	HO⊌SING, CONNECTOR 50P
911	1-608-036-00	PRINTED CIRCUIT BOARD, BA-3
912	3-531-576-31	RIVET (DIA. 3), NYLON
913	3-676-082-00	WASHER, SCREW
914	3-676-295-00	HINGE, VA
915	3-676-298-00	SHAFT, VA GUIDE
916	3-676-299-00	HOLDER (D), PC BOARD
917	3-676-313-00	HOLDER, EB CONNECTOR
		U/C: UP TO S/N 10835
		J: UP TO S/N 10500
918	3-676-314-00	CONTACT
919	3-676-315-00	HOLDER, BATTERY CASE
920	3-676-316-03	CASE, BATTERY
921	3-676-348-02	SHEET, INSULATING (TR)
922	3-676-352-00	CAP, C HOLDER
923	3-676-353-02	SHEET, INSULATING
924	3-676-365-00	HOLDER, V CONNECTOR
925	3-676-369-00	NUT, SPACER
926	3-676-370-00	PIN, CN HOLDER
927	3-676-371-00	NUT, S
928	4-812-134 - 11	RIVET NYLON 3.5
929	3-678-736-00	COVER, BATTERY
930	3-678-742-00	LID (A), VA CASE
931	3-678-744-00	LID (B), VA CASE
933	3-676-384-00	CLAMP, HARNESS
5 50		

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ORNAMENTAL PANEL ORNAMENTAL PANEL

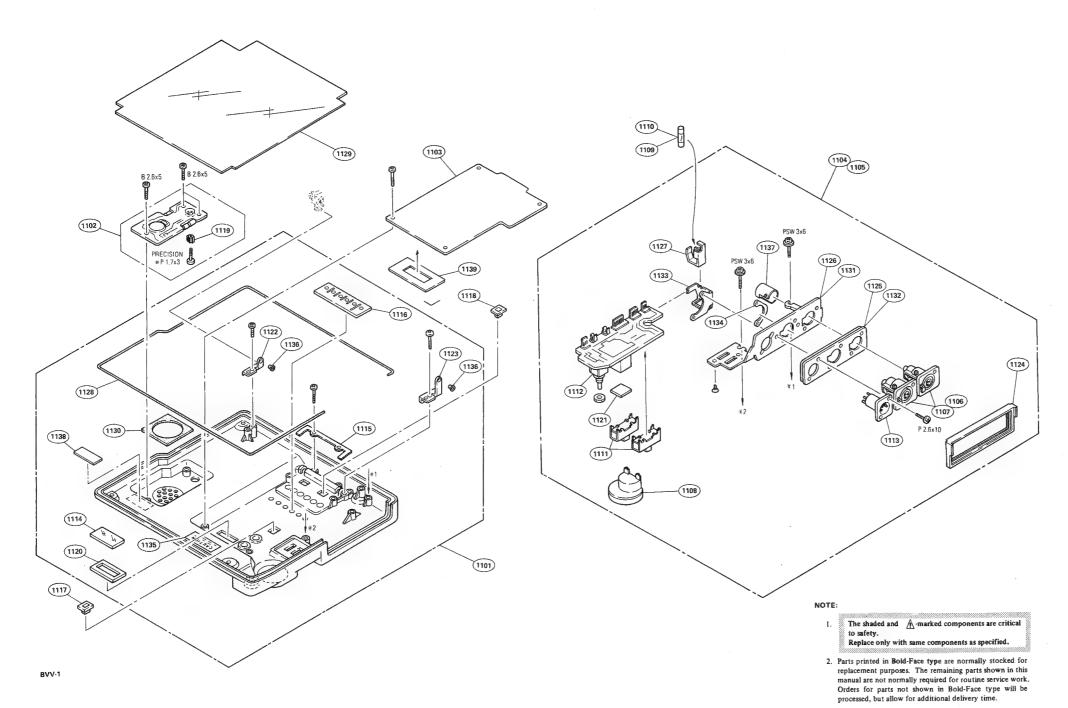


No.	Parts No.	Description
1001	A-6703-257-C	LID ASS'Y, CONTROL
1002	A-6703-259-B	LID ASS'Y, UPPER
1003	A-6703-260-A	LID ASS'Y, BATTERY CASE
1004	X-3676-061-0	KNOB ASS'Y, REWIND
1005	X-3676-062-0	KNOB ASS'Y, ELECT
1006	X-3676-063-0	SUSPENSION ASS'Y (S)
1007	X-3676-064-0	HANDLE ASS'Y
1009	3-646-377-00	SPRING
1011	3-669-595-00	WASHER (2), STOPPER
1012	3-676-005-00	SCREW, LID, BATTERY CASE
1013	3-676-060-00	CABINET (MAIN-VS)
1014	3-676-073-00	LABEL (CN)
1015	3-676-089-03	SCREW, LID
1016	3-676-125-00	PIN, STOPPER
1017	3-676-332-03	GUARD, TAPE
1018	3-676-339-11	RUBBER
1019	3-676-349-00	SHOE, V
1020	3-676-350-00	PAD (V), SHOULDER
1021 1024 1025	3-676-363-00 3-676-379-00 3-703-081-31	RUBBER, LID, BATTERY BUSHING (M5), SCREW LABEL, CAUTION
1026 1027 1028 1029 1030	4-882-768-03 3-678-748-00 3-649-268-11 3-701-439-21 3-701-441-21	

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Side Panel Block (1)



No.	Parts No.	Description
1101 1102	A-6703-254-A A-6713-142-A	PANEL SUB ASS'Y, SIDE MOUNTED CIRCUIT BOARD, SP-10 U/C: UP TO S/N 11015 J: UP TO S/N 10910
	A-6713-142-B	MOUNTED CIRCUIT BOARD, SP-10 U/C: S/N 11016 AND LATER J: S/N 10911 AND LATER
1103	A-6717-283-A	MOUNTED CIRCUIT BOARD, TC-21 U/C: UP TO S/N 11015 J: UP TO S/N 10910
	A-6717-283-B	MOUNTED CIRCUIT BOARD, TC-21 U/C: S/N 11016 AND LATER J: S/N 10911 AND LATER
1104	A-6717-286-A	MOUNTED CIRCUIT BOARD, CP-49 (FOR U/C)
1105	A-6717-287-A	MOUNTED CIRCUIT BOARD, CP-49 (FOR J)
1106 1107	1-509-176-41 1-509-184-31	RECEPTACLE, XLR (FOR J) RECEPTACLE, XLR (FOR U/C)
1108 1109	1-520-433-00 1-532-594-00	METER, LEVEL FUSE, GLASS TUBE (FOR J)
1110	1-532-656-00	FUSE, GLASS TUBE (FOR U/C)
1111 1112	1-552-574-21 1-553-448-00	SWITCH, SLIDE SWITCH, TOGGLE
1113	1-560-999-11	RECEPTACLE, XLR, 4P
1114.	3-662-710-00	COVER, COUNTER
1115	3-676-071-00	SPRING
1116	3-676-075-00	COVER, LED U/C: UP TO S/N 10765 J: UP TO S/N 10350
	3-675-075-03	COVER, LED U/C: S/N 10766 AND LATER J: S/N 10351 AND LATER
1117	3-676-076-00	KNOB (A), SWITCH
1118	3-676-083-00	KNOB (B), SWITCH
1119		SHAFT, KNOB
1120	3-676-106-00	FILM, COUNTER COVER
1121	3-676-107-00	CUSHION, METER
1122	3-676-235-03	ARM (A), HINGE
1123	3-676-236-03	ARM (B), HINGE
1124 1125	3-676-239-00 3-676-242-00	PAD, CN HOLDER SPACER, XLR (FOR U/C)
1126	3-676-254-00	HOLDER, CONNECTOR (FOR U/C)
1127	3-676-325-00	HOLDER, RESERVE FUSE
1128	3-676-339-11	RUBBER
1129	3-676-351-00	SHEET, INSULATING
1130	3-676-354-00	CUSHION, SPEAKER
1131	3-676-358-00	HOLDER, CONNECTOR (FOR J)
1132	3-676-359-00	SPACER, XLR (FOR J)
1133	3-676-367-00	BRACKET, DC CONNECTOR
1134 1135	3-676-380-00 3-703-044-26	NUT, PLATE, XLR (FOR J) LABEL, CAUTION
1136	3-703-074-00	CASE ASSIV VI B SHIELD (FOR LUC)
1137	X-3676-066-0 X-3676-067-0	CASE ASS'Y, XLR SHIELD (FOR U/C) CASE ASS'Y, XLR SHIELD (FOR J)
1138	3-678-782-00	LABEL, DOLBY (C)
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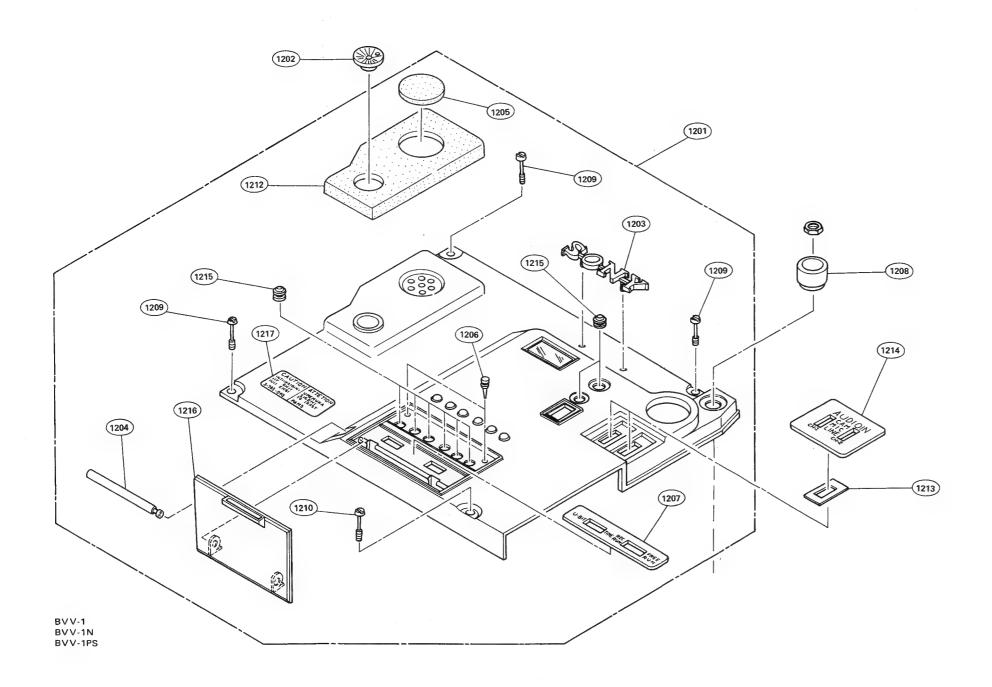
3-678-785-00 COVER, DUST, COUNTER

1139

Item with no part number and/or no description are not stocked because they are seldom required for routine

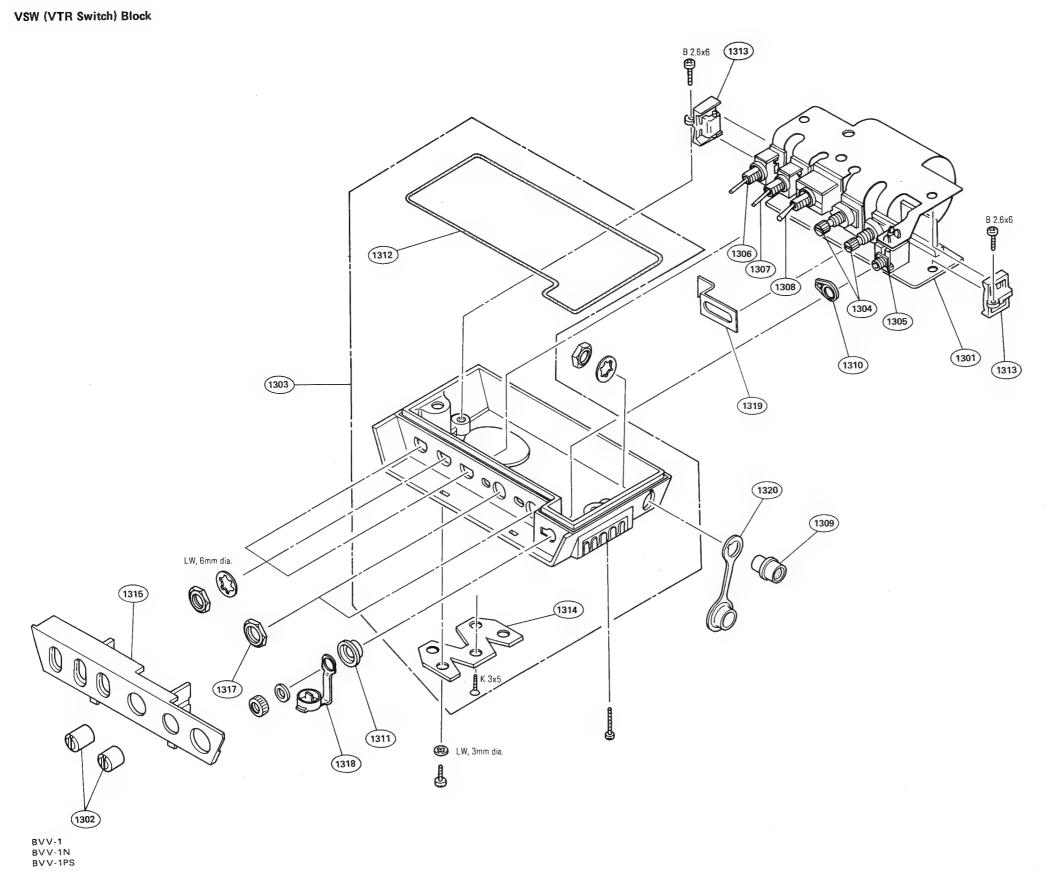
SIDE PANEL (2) SIDE PANEL (2)

Side Panel Block (2)



No.	Parts No.	Description
1201	A-6703-254-A	PANEL SUB ASS'Y, SIDE U/C: UP TO S/N 11015 J: UP TO S/N 10910
	A-6703-254-D	PANEL SUB ASS'Y, SIDE U/C: S/N 11016 AND LATER J: S/N 10911 AND LATER
1202	X-3676-028-0	KNOB ASS'Y, CONTROL U/C: UP TO S/N 11015 J: UP TO S/N 10910
	X-3676-028-2	KNOB ASS'Y, CONTROL U/C: S/N 11016 AND LATER J: S/N 10911 AND LATER
1203	3-675-901-00	EMBLEM, SONY
1204	3-676-072-00	SHAFT, TC LID
1205	3-676-080-00	PAD (B), EAR
1206	3-676-081-00	CUSHION, TC U/C: UP TO S/N 10765 J: UP TO S/N 10350
	3-676-081-02	CUSHION, TC U/C: S/N 10766 AND LATER J: S/N 10351 AND LATER
1207	3-676-084-00	LABEL (TC)
1208	3-676-086-00	GUARD, SWITCH
1209 1210	3-676-089-03 3-676-089-13	SCREW, LID SCREW, LID
1212	3-676-238-00	PAD (A), EAR
1213	3-676-240-00	PLATE, BLIND, SWITCH
1214	3-676-241-00	LABEL (AU)
1215	3-676-244-00	COVER, SWITCH
		U/C: UP TO S/N 10765
	3-676-244-11	J: UP TO S/N 10350 COVER, SWITCH
	3-0/0-244-11	U/C: S/N 10766 AND LATER J: S/N 10351 AND LATER
1216 1217	3-676-376-00 3-703-043-21	LID, TC LABEL, CAUTION, MAIN

- The shaded and A -marked components are critical to safety.
 Replace only with same components as specified.
- Parts printed in Bold-Face type are normally stocked for replacement purposes. The remaining parts shown in this manual are not normally required for routine service work.
 Orders for parts not shown in Bold-Face type will be processed, but allow for additional delivery time.
- Item with no part number and/or no description are not stocked because they are seldom required for routine service.



No.	Parts No.	Description
1301 1302 1303 1304 1305	A-6713-140-A X-3664-208-0 X-3676-059-0 1-226-677-00 1-507-251-XX	MOUNTED CIRCUIT BOARD, LC-5 KNOB ASS'Y, FADE HOLDER SUB ASS'Y, VSW RES, VAR, CARBON 20K JACK
	1-553-626-00 1-553-627-00 1-554-271-00 1-562-086-00 3-437-228-00	SWITCH, TOGGLE SWITCH, TOGGLE SWITCH, TOGGLE CONNECTOR (ROUND TYPE) 5P INSULATOR, JACK
1311 1312 1313 1314 1315	3-437-229-01 3-676-339-11 3-676-341-00 3-676-344-00 3-676-345-00	INSULATOR (B), JACK RUBBER GUIDE, LC STOPPER, M ESCUTCHEON, VSW
1317 1318 1319 1320	3-703-078-01 3-849-405-00 X-3676-069-0 3-678-769-00	NUT COVER, EARPHONE JACK SHIELD ASS Y AUDIO CAP

- The shaded and A -marked components are critical to safety.
 Replace only with same components as specified.
- Parts printed in Bold-Face type are normally stocked for replacement purposes. The remaining parts shown in this manual are not normally required for routine service work.
 Orders for parts not shown in Bold-Face type will be processed, but allow for additional delivery time.
- 3. Item with no part number and/or no description are not stocked because they are seldom required for routine

16-3. ELECTRICAL PARTS LIST

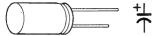
Parts that are \underline{not} listed in the "reference numbers order list" are shown in following table.

Reference numbers are omitted.

ELECTROLYTIC CAPACITOR

0.47μF through 470μF

6.3WV through 50 (63, 100)WV



Parts No. 1-123-00 0-00 --

/		T
Value		Parts No.
0.47⊭F	50V	
	100	379
1	50	
	100	380
2.2	50	
	100	381
3.3	25	
	35	
	50	
	100	382
4.7	25	
	35]
	50	
	63	369
10	10	
	16	
	25	
	35	
	50	356
22	16	
	25	330

Value		Parts No.
22µF	35V	342
	50	
	63	371
33	6.3	
	10]
	16	318
	25	
	35	343
	50	
	63	372
47	6.3	
	10	306
	16	
	25	332
	35	
	50	359
100	6.3	
	10	307
	16	
	25	333
	35	345
		ı

Value		Parts No.
100µF	50V	360
220	6.3	
	10	308
	16	321
	25	334
	35	346
	50	361
330	6.3	
	10	309
	16	322
	25	335
	35	347
	50	362
470	6.3	298
	10	310
	16	323
	25	336
	35	348
	50	
	63	377

CHIP CERAMIC CAPACITOR



220pF through $0.018\mu\text{F(B)}\pm10\%$ 50WV $0.022\mu\text{F}$ through $0.068\mu\text{F(F)}+80\%$ 50WV $0.1\mu\text{F(F)}+80\%$ 25WV

Parts No. 1-163-□□-00 ---

Value	Parts No.
100pF	_]
120	_
150	
180	_
220	001
270	002
330	003
390	004
470	005
560	006
680	007
820	800

Value	Parts No.
0.001µF	009
0.0012	010
0.0015	011
0.0018	012
0.0022	013
0.0027	014
0.0033	015
0.0039	016
0.0047	017
0.0056	018
0.0068	019
0.0082	020

Value	Parts No 000 -
0.01μF	021
0.012	022
0.015	023
0.018	024
0.022	033
0.027	
0.033	034
0.039	
0.047	035
0.056	
0.068	036
0.082	
0.1	038

CHIP RESISTOR



 $\pm 5\%$ 1/10W 2.2 Ω through 3.3M Ω

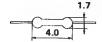
Parts No. 1-216-□□□-00 -

	T	Γ''			1		T _
Value	Parts No.	Value	Parts No.	Value	Parts No.	Value	Parts
Value	- 000 -	Value	- 000 -	Value	- 000 -	72.45	- 00
1Ω		33 Ω	013	1kΩ	049	33k Ω	08
1.1	_	36	014	1.1	050	36	08
1.2		39	015	1.2	051	39	08
1.3		43	016	1.3	052	43	08
1.5	_	47	017	1.5	053	47	08
1.6		51	018	1.6	054	51	09
1.8	_	56	019	1.8	055	56	09
2		62	020	2	056	62	09
2.2	298	68	021	2.2	057	68	09
2.4	301	75	022	2.4	058	75	09
2.7	302	82	023	2.7	059	82	09
3	303	91	024	3	060	91	09
3.3	304	100Ω	025	3.3	061	100k Ω	09
3.6	305	110	026	3.6	062	110	09
3.9	306	120	027	3.9	063	120	09
4.3	307	130	028	4.3	064	130	10
4.7	308	150	029	4.7	065	150	10
5.1	297	160	030	5.1	066	160	10
5.6	309	180	031	5.6	067	180	10
6.2	310	200	032	6.2	068	200	10
6.8	311	220	033	6.8	069	220	10
7.5	312	240	034	7.5	070	240kΩ	10
8.2	313	270	035	8.2	071	270	10
9.1	314	300	036	9.1	072	300	10
10Ω	001	330	037	10k Ω	073	330	10
11	002	360	038	11	074	360	11
12	003	390	039	12	075	390	11
13	004	430	040	13	076	430	11
15	005	470	041	15	077	470	11
16	006	510	042	16	078	510	11
18	007	560	043	18	079	560	11
20	008	620	044	20	080	620	11
22	009	680	045	22	081	680	11
24	010	750	046	24	082	750	11
27	011	820	047	27	083	820	11
30	012	910	048	30	084	910	12

CARBON RESISTOR (1/8W)

$\pm 5\%$, 1/8W, non-special type 2.2 Ω through 1M Ω





- Parts No. 1-246-□□□-00 -

Value	Parts No.	Value	Parts No.
1kΩ	783	33k Ω	801
1.1	844	36	862
1.2	784	39	802
1.3	845	43	863
1.5	785	47	803
1.6	846	51	864
1.8	786	56	804
2	847	62	865
2.2	787	68	805
2.4	848	75	866
2.7	788	82	806
3.0	849	91	867
3.3	789	100kΩ	807
3.6	850	110	868
3.9	790	120	808
4.3	851	130	869
4.7	791	150	809
5.1	852	160	870
5.6	792	180	810
6.2	853	200	871
6.8	793	220	811

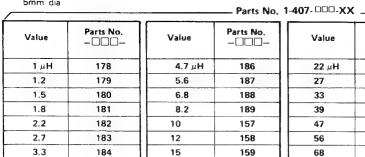
Parts No. 1-247-□□□-00

Value	Parts No.
240k Ω	054
270	046
300	055
330	047
360	056
390	048
430	057
470	049
510	058
560	050
620	059
680	051
750	060
820	052
910	061
1M Ω	053

/			- Parts No.	1-240-	LJ LJ LJ.	00
Value	Parts No.	Value	Parts No.		/alue	Parts No.
1Ω	_	33 Ω	765	1 -	kΩ	783
1.1		36	826	1	.1	844
1.2	_	39	766	1	.2	784
1.3	_	43	827	1 1	.3	845
1.5	_	47	767	1 1	.5	785
1.6	_	51	828	1	.6	846
1.8	_	56	768	1	.8	786
2	_	62	829	2	!	847
2.2	751	68	769	2	.2	787
2.4	812	75	830	2	.4	848
2.7	752	82	770	2	7	788
3	813	91	831	3	.0	849
3.3	753	100Ω	771	3	.3	789
3.6	814	110	832	1 3	3.6	850
3,9	754	120	772	3	3.9	790
4.3	815	130	833	1 4	.3	851
4.7	755	150	773	1 4	.7	791
5.1	816	160	834	1 5	5.1	852
5.6	756	180	774	5	.6	792
6.2	817	200	835	6	5.2	853
6.8	757	220	775	E	3.8	793
7.5	818	240	836	7	.5	854
8.2	758	270	776	1 8	3.2	794
9.1	819	300	837] g	9.1	855
10Ω	759	330	777		0k Ω	795
11	820	360	838	1	1	856
12	760	390	778	1 1	2	796
13	821	430	839	1 1	3	857
15	761	470	779	1 7	15	797
16	822	510	840] [1	16	858
18	762	560	780		18	798
20	823	620	841	1 2	20	859
22	763	680	781	7 7	22	799
24	824	750	842	1 2	24	860
27	764	820	782	1 2	27	800
30	825	910	843		30	861

MICRO INDUCTOR





18

Value	Parts No.
22 μH	161
27	162
33	163
39	164
47	165
56	166
68	167
82	168

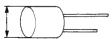
Value	Parts No.
100 µH	169
120	170
150	171
180	172
220	173
270	174
330	175
390	176
470	177

MICRO INDUCTOR

3.9

470 μH through 33 mH ±5%

160



185

10mm dia

Parts No. 1-407-□□□-00 -

Value	Parts No.
470 µH	488
560	489
680	490
820	491
1 mH	492
1.2	493

Val	ue	Parts No.
1	.5 mH	494
1	.8	495
2	.2	496
2	.7	497
3	.3	498
3	.9	499

Value	Parts No.	
4.7 mH	500	
5.6	501	
6.8	502	
8.2	503	
10	504	
12	505	

Value	Parts No.		
15 mH	506		
18	507		
22	508		
27	509		
33	510		

CONNECTOR

2P

3P

4P 5P

6P

7P

8P

10P

12P

14P

top-type receptacle

1-560-456-00

1-560-466-00 1-560-467-00

1-560-468-00

1-560-469-00

1-560-591-00

1-560-470-00

1-560-471-00

1-560-472-00

1-560-652-00

side-type receptacle





2P	1-560-455-00
3P	1-560-459-00
4P	1-560-460-00
5P	1-560-461-00
6P	1-560-462-00
7P	1-560-922-00
8P	1-560-463-00
10P	1-560-464-00
12P	1-560-465-00
13P	1-560-923-00





2P	1-561-581-00
3P	1-561-584-00
4P	1-561-585-00
5P	1-561-586-00
6P	1-561-587-00
7P	1-561-689-00
8P	1-561-588-00
10P	1-561-589-00
12P	1-561-590-00
13P	1-562-065-00
14P	1-561-750-00

ABBREVIATIONS

Ref. No.	Description	Ref. No.	Description	Ref. No.	Description
coo,cvoo	CAPACITOR	HOO	HEAD	R00, RV00	RESISTOR
CNOD	CONNECTOR	ICDD	IC	\$00, SW 00	SWITCH
DOO	DIODE	Joo	JACK	TOO	TRANSFORMER
DL aa	DELAY LINE	LOO	INDUCTOR	THOO	THERMISTOR
FOO	FUSE	M 🗆 🗆	MOTOR	XOO	CRYSTAL
FBOO	FERRITE BEAD	PMOD	SOLENOID		
FLOO	FILTER	000	TRANSISTOR		

All capacitors are in micro farads unless otherwise specified.

All inductors are in micro henries unless otherwise specified.

All resistors are in ohms.

BA-3 BOARD 1-608-036-00 o PRINTED CIRCUIT BOARD, BA-3 1-613-381-11 o PRINTED CIRCUIT BOARD, DUS-34 C1' 1-125-309-00 s DOUBLE LAYERS 0.33F +5.5V CN1 1-508-901-00 o 3P 1-509-984-00 o HOUSING 1-509-984-00 o CONTACT	Ref.N	No. Parts No. SP	Description	Ref.No	. Parts No. SF	Description
Cl' 1-125-309-00 s DOUBLE LAYERS 0.33F +5.5V CN1 1-508-901-00 o 3P 1-509-984-00 o HOUSING	BA-3	BOARD		DUS-34	BOARD	
1-509-984-00 o HOUSING		1-608-036-00 o	PRINTED CIRCUIT BOARD, BA-3		1-613-381-11	PRINTED CIRCUIT BOARD, DUS-34
1-305-902-00 0 CONTROL	C1'	1-125-309-00 s	DOUBLE LAYERS 0.33F +5.5V	CN1	1-509-984-00	HOUSING
R1 1-214-531-00 m METAL 82 1% 1/8W D1 8-719-920-40 s ESAC82-004	R1	1-214-531-00	METAL 82 1% 1/8W		0.710.000.70	701080 004

CP-49	BOARD		
À	A-6717-286-A	0	MOUNTED CIRCUIT BOARD, CP-49
	1-533-037-XX	8	HOLDER, FUSE
Dl	8-719-101-69	s	RD8.2E-L1
D2	8-719-815-55	8	181555
D3	8-719-815-55	8	1\$1555

	D3	8-719-815-55	В	1\$1555
1	F1	1-532-656-00		6.3A
	IC1	8-741-106-60	s	BX1066(SONY)
	ME1	1-520-433-00	s	"BATT/AUDIO"
	RV1	1-228-475-00	s	VAR, CERMET 20K
	S1 S2	1-552-574-21 1-552-574-21		
		1-429-067-00	-	
	Т2	1-447-00/-00	S	ELCKOL BONE

```
Ref.No. Parts No. SP Description
                                                                Ref.No. Parts No. SP Description
LC-6 BOARD
                                                                      8-719-160-03 s RD2.2FC
     A-6713-204-A o MOUNTED CIRCUIT BOARD, LC-6
     1-163-259-00 s CERAMIC CHIP 220PF 5% 50V
                                                                TCI
                                                                     8-751-840-00 s CX184(SONY)
C19
     1-163-259-00 s
                      CERAMIC CHIP 220PF 5% 50V
     1-131-376-00 s TANTALUM 6.8 10% 10V
C24
     1-131-376-00 s TANTALUM 6.8 10% 10V
C25
                                                                RV1
                                                                      1-230-337-11 s VAR, CARBON 10K"VOLUME"
Dl
      8-719-101-23 m ISS123
D2
      8-719-101-23 s 1SS123
                                                                SPI
                                                                     1-503-059-00 s SPEAKER 4 OHM 0.1W
ICl
     8-759-745-60 s NJM4560D(JRC)
                      TC4053BP(TOSHIBA)
      8-759-240-53 в
IC2
IC3
      8-759-745-60
                      NJM4560D(JRC)
                                                                SS-23 BOARD
                                                                      A-6717-299-A o MOUNTED CIRCUIT BOARD, SS-23
     1-507-251-XX s "EARPHONE"
J1
                                                                C1
                                                                      1-130-484-00 s FILM 0.012 5% 50V
                                                                      1-131-341-00 s TANTALUM 0.1 10% 35V
                                                                C4
                                                                      1-131-404-00 s TANTALUM 0.22 20% 35V
                                                                C5
                                                                      1-131-404-00
                                                                                      TANTALUM 0.22 20% 35V
                                                                 C6
                                                                                    6
     8-729-100-66
                      2SC1623
                                                                C7
                                                                       1-131-404-00 в
                                                                                      TANTALUM 0.22 20% 35V
Q2
      8-729-663-47
                   8
                      2501364
      8-729-663-47
                      2SC1364
                                                                C10
                                                                      1-130-484-00 s
                                                                                       FILM 0.012 5% 50V
Q3
                  S
      8-729-663-47
                      2SC1364
                                                                      1-131-404-00 s TANTALUM 0.22 20% 35V
04
                                                                C11
                   8
Q5
      8-729-100-66
                                                                      1-131-404-00 s TANTALUM 0.22 20% 35V
                      2SC1623
                                                                C13
                                                                      1-131-404-00
                                                                                    s TANTALUM 0.22 20% 35V
                                                                 C15
Q6
      8-729-663-47
                      2SC1364
                                                                C17
                                                                      1-130-483-00
                                                                                       FILM 0.01 5% 50V
Q7
      8-729-663-47 s
                      2SC1364
      8-729-663-47 s 2SC1364
                                                                C21
                                                                      1-131-404-00 s TANTALUM 0.22 20% 35V
08
                                                                      1-131-379-00 s TANTALUM 22 10% 10V
                                                                C23
                                                                      1-124-313-00
                                                                                    s ELECT 100 20% 16V
                                                                 C27
                                                                C29
                                                                      1-124-313-00 s ELECT 100 20% 16V
R 1
      1-247-791-00 s CARBON 22 5% 1/6W
                                                                C32
                                                                      1-163-227-00 s CERAMIC CHIP 10PF 5% 50V
      1-247-791-00 s CARBON 22 5% 1/6W
R7
                                                                C35
                                                                      1-130-483-00 s FILM 0.01 5% 50V
                                                                      1-124-313-00 s ELECT 100 20% 16V
                                                                C39
                                                                      1-131-350-00 s TANTALUM 3.3 10% 35V
                                                                C104
RV1
     1-226-677-00 s VAR, CARBON 20K
                                                                C105
                                                                      1-163-235-00 s CERAMIC CHIP 22PF 5% 50V
                       "AUDIO LEVEL CH-1"
                                                                C106
                                                                      1-163-235-00 s
                                                                                       CERAMIC CHIP 22PF 5% 50V
RV2
     1-226-677-00 s
                       VAR, CARBON 20K
                       "AUDIO LEVEL CH-2"
                                                                C115
                                                                      1-130-489-00 s FILM 0.033 5% 50V
RV3
      1-228-461-00 s
                      VAR, CERMET 50K
                                                                      1-131-344-00 s TANTALUM 0.33 10% 35V
                                                                C116
      1-228-461-00 s VAR, CERMET 50K
                                                                                       ELECT 2200 20% 16V
                                                                C118
                                                                      1-123-566-00
                                                                                    8
RV5
      1-228-459-00 B VAR, CERMET 10K
                                                                      1-131-347-00
                                                                                       TANTALUM 1.0 10% 35V
                                                                C121
                                                                                    8
                                                                C122
                                                                      1-163-239-00
                                                                                       CERAMIC CHIP 33PF 5% 50V
                                                                C130 1-131-381-00 s TANTALUM 47 10% 10V
Sl
      1-554-355-00 s LEVER ROCKER"METER SELECT"
      1-554-356-00 s LEVER ROCKER"CH SELECT"
      1-554-882-00 в
                                                                CN102 1-562-046-00 o 12P
s3
                      LEVER ROCKER"AUDIO MANU/AUTO"
                      LEVER ROCKER"AUDIO MANU/AUTO"
54
      1-554-882-00 s
                                                                CN104 1-562-046-00 o 12P
THI
      1-800-195-00 m S-250
                                                                DI
                                                                       8-719-101-23 s ISS123
                                                                       8-719-100-05 s 1S2837
                                                                 D2
                                                                                    s 1S2835
                                                                 D3
                                                                       8-719-100-03
                                                                 D4
                                                                       8-719-100-03 s 1S2835
                                                                D5
                                                                       8-719-100-03 s 1S2835
SP-10 BOARD
                                                                 D6
                                                                       8-719-100-05 s 1S2837
                                                                      8-719-100-05 s 1S2837
8-719-100-05 s 1S2837
                                                                D7
      A-6713-142-B o MOUNTED CIRCUIT BOARD, SP-10
                                                                D101
                                                                 D102
                                                                      8-719-100-05
                                                                                    в 1S2837
      1-131-344-00 s TANTALUM 0.33 10% 35V 1-123-827-00 s EJECT 220 20% 4V 1-161-475-00 s CERAMIC 0.033 10% 50V
Cl
                                                                 D103
                                                                      8-719-100-03 s 1S2835
C2
C3
                                                                n106
                                                                      8-719-200-02 s 10E-2
C4
      1-161-475-00 s CERAMIC 0.033 10% 50V
                                                                D107
                                                                      8-719-200-02 s 10E-2
                                                                      8-719-100-03 s 1S2835
                                                                D108
                                                                D109 8-719-100-03 s 1S2835
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Ref.No. Parts No. SP Description
                                                                      Ref.No. Parts No. SP Description
      8-751-941-03 s CX194B(SONY)
                                                                      X101 1-567-064-00 s 34.4KHz
X102 1-567-068-00 s 3.58MHz
    8-749-911-55 s BX1155(SONY)
8-759-729-03 s NJM2903D(JRC)
      8-749-911-55 s BX1155(SONY)
IC3
     8-759-345-38 s HD14538BP(HITACHI)
TC4
IC101 8-757-850-00 s CX785(SONY)
IC102 8-759-101-14 s uPD8243C(NEC)
IC103 8-759-245-12 s TC4512BP(TOSHIBA)
IC104 8-759-245-12 s TC4512BP(TOSHIBA)
                                                                       SW-82 BOARD
IC105 8-759-345-38 s HD14538BP(HITACHI)
                                                                             1-608-037-00 o PRINTED CIRCUIT BOARD, SW-82
IC106 8-759-240-20 s TC4020BP(TOSHIBA)
IC107 8-759-240-69 s TC4069UBP(TOSHIBA)
                                                                             1-553-577-00 s MICRO "UNTHREAD END"
                                                                             1-553-650-11 s MICRO "UNTHREAD END"
IC108 8-759-200-59 s TD62703P(TOSHIBA)
IC109 8-759-200-59 s TD62703P(TOSHIBA)
                     s BX1196(SONY)
IC110 8-741-119-60
IC111 8-741-107-10 s BX1071(SONY)
IC112 1-464-241-00 s DC LEVEL SENSOR
IC113 8-759-759-82 s ROM, MBM27C32
                                                                       TC-33 BOARD
                                                                             A-6717-369-A o MOUNTED CIRCUIT BOARD, TC-33
      1-408-654-00 a MICRO 1mH
T.1
                                                                             1-131-347-00 s TANTALUM 1 10% 35V
1-163-235-00 s CERAMIC CHIP 22PF 5% 50V
      1-408-298-00 s 2mH
                                                                       C2
1.2
                                                                       C4
                                                                             1-131-365-00 s TANTALUM 10 10% 20V
1-163-243-00 s CERAMIC CHIP 47PF 5% 50V
                                                                       C5
                                                                       C7
PW101 1-464-226-00 s DC-DC CONVERTER
                                                                       C8
                                                                             1-163-243-00 s CERAMIC CHIP 47PF 5% 50V
                                                                             1-163-141-00 s CERAMIC CHIP 0.001 5% 50V
                                                                       C11
                                                                             1-131-349-00 s TANTALUM 2.2 10% 35V
                                                                       C12
                                                                             1-131-367-00 s TANTALUM 22 10% 20V
       8-729-612-22 s 2SA1162
                                                                       C13
Q1
                                                                              1-131-367-00 s
       8-729-100-66 s 2SC1623
                                                                                                TANTALUM 22 10% 20V
Q2
Q3
       8-729-100-66 s 2SC1623
                                                                             1-131-368-00 s TANTALUM 3.3 10% 16V
                     s 2SC1623
Q4
       8-729-100-66
                                                                             1-131-349-00 s TANTALUM 2.2 10% 35V 1-131-349-00 s TANTALUM 2.2 10% 35V 1-131-344-00 s TANTALUM 0.33 10% 35V
       8-729-100-66 s 2SC1623
Q5
                                                                       C25
                                                                       C26
Q6
       8-729-100-66 s 2SC1623
                                                                       C27
       8-729-100-66 s 2SC1623
Q7
Q101 8-729-100-66 s 2SC1623
 Q102 8-729-100-66 s 2SC1623
                                                                             8-719-100-05 s 1S2837
8-719-100-05 s 1S2837
     8-729-100-66 s 2SC1623
0103
                                                                       D1
                                                                       D2
 Q104 8-729-100-66 s 2SC1623
                                                                              8-719-100-05 s 1S2837
                                                                       D3
                     в 2SC1623
      8-729-100-66
                                                                              8-719-902-27 s EBR34025"RF"
                                                                       D4
 Q107 8-729-100-76
                     s 2SA812
                                                                              8-719-902-27 s EBR3402S"SERVO"
 Q108
      8-729-100-76
                     s 2SA812
                                                                              8-719-902-27 s EBR3402S"HUMID"
8-719-902-27 s EBR3402S"SLACK"
 Q109 8-729-100-76 s 2SA812
                                                                       D6
                                                                       D7
                                                                              8-719-902-27 s EBR34025"TAPE END"
8-719-902-27 s EBR34025"BATTERY"
       8-729-100-76 s
                          2SA812
 0110
                                                                       D8
       8-729-100-66 s
 0111
                                                                       D9
                                                                             8-719-100-05 s 1S2837
 Q112 8-729-100-66
                     s 2SC1623
                                                                       D10
                     s 2SC1623
 Q113 8-729-100-66
 Q114 8-729-100-66 s 2SC1623
                                                                       D11
                                                                              8-719-100-05 s
                                                                       D12
                                                                              8-719-100-05 s 1S2837
                                                                              8-719-100-05 s 1S2837
                                                                       D13
                                                                              8-719-100-05 s
                                                                                                182837
                                                                       D14
      1-214-591-00 s METAL 27K 1% 1/8W
                                                                              8-719-100-05 s 1S2837
                                                                       D15
       1-214-590-00 s
                          METAL 24K 1% 1/8W
      1-210-832-00 s CARBON 6.8M 5% 1/4W
1-214-587-00 s METAL 18K 1% 1/8W
 R193 1-210-832-00 s
                                                                       D16
                                                                              8-719-100-05 s 1S2837
                                                                              8-719-100-05 s 1S2837
 R194
                                                                       D17
       1-214-576-00 s METAL 6.2K 1% 1/8W
                                                                              8-719-100-05 s 1S2837
 R237
                                                                       D18
 R238 1-210-829-00 s CARBON 5.1M 5% 1/4W
                                                                              8-719-100-05 s IS2837
                                                                       D19
       1-228-461-00 s VAR, CERMET 50K
 RV1
                                                                       ICl
                                                                              8-759-909-16 m CX-7907A(SONY)
       1-228-463-00 s VAR, CERMET 200K
1-228-461-00 s VAR, CERMET 50K
 RV3
                                                                       IC2
                                                                              8-759-912-92 s CX-23051(SONY)
                                                                              8-759-200-99 s TC4051BF(TOSHIBA)
 RV4
                                                                       TC3
                                                                              8-759-906-53 s TL062CPS(TI)
8-759-200-99 s TC4051BF(TOSHIBA)
                      s VAR, CERMET 20K
       1-228-460-00
 RV5
                                                                       IC4
       1-228-459-00 s VAR, CERMET 10K
                                                                       IC5
       1-228-461-00 WAR, CERMET 50K
 RV101 1-228-458-00 s VAR, CERMET 5K
 RV102 1-228-464-00 s VAR, CERMET 500K
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Ref.No. Parts No. SP Description
                                                                   Ref.No. Parts No. SP Description
     8-759-200-90 s
                       TC4538BF(TOSHIBA)
                                                                   CN311 1-508-696-00 o 4P
      8-759-200-65 s
                       TC4013BF(TOSHTRA)
TC8
      8-759-906-43 в
                       SM6430C(NPC)
IC9
                                                                         8-759-200-90 s TC4538BF(TOSHIBA)
                                                                   IC1
IC10 8-759-340-46 в
                       HD14046BP(HITACHI)
IC11 8-759-200-79 8
                       TC4069BF(TOSHIBA)
                                                                   RV1
                                                                         1-228-478-00 s VAR, CERMET 200K
                                                                   RV2
                                                                         1-228-476-00 s VAR, CERMET 50K
IC12 8-759-200-84 B
                       TC4081BF(TOSHIBA)
IC13 8-759-200-83 8
                       TC4071BF(TOSHIBA)
IC14 8-759-200-78 B TC4030BF(TOSHIBA)
                                                                         TR-15 BOARD
IC15 8-759-178-05 s
                       uPC78L05(NEC)
IC16 8-759-201-05 B
                       TC4056BF(TOSHIBA)
                                                                         1-131-381-00 s TANTALUM 47 10% 10V
                                                                   C1
                                                                         1-131-347-00 s TANTALUM 1.0 10% 35V
                                                                   C2
                                                                         1-131-345-00 s TANTALUM 0.47 10% 35V
1-131-345-00 s TANTALUM 0.47 10% 35V
                       TC4056BF(TOSHIBA)
IC17 8-759-201-05 s
                                                                   C8
IC18 8-759-201-05 s
                       TC4056BF(TOSHIBA)
                                                                   C9
                       TC4056BF(TOSHIBA)
IC19 8-759-201-05 s
                                                                                          CERAMIC CHIP 47PF 5% 50V
                                                                   C12
                                                                         1-163-243-00
TC20
      8-759-201-05
                    8
                       TC4056BF(TOSHIBA)
IC21 8-759-201-05
                       TC4056BF(TOSHIBA)
                                                                   C14
                                                                         1-131-408-00 s TANTALUM 1 20% 25V
                                                                         1-131-419-00 m TANTALUM 2.2 20% 10V
                                                                   C15
                                                                         1-123-566-00 s ELECT 2200 20% 16V
                                                                   C16
LCD1 1-806-019-21 a LIQUID CRYSTAL WITH LAMPS
                                                                         8-719-101-23
                                                                                       s 1SS123
                                                                   D2
                                                                         8-719-101-23
                                                                                       s 1SS123
      8-729-100-66 s 2SC1623
01
                                                                         8-719-101-23
                                                                                       s 1SS123
                                                                   D3
      8-729-100-66 s
                                                                         8-719-200-02
                                                                                       s 10E-2
                                                                   D4
      8-729-100-66 в
                       2SC1623
                                                                         8-719-160-63 s
      8-729-100-66
                       2SC1623
Q5
      8-729-100-66
                   8
                       2SC1623
                                                                   D6
                                                                         8-719-200-02 m 10E-2
                                                                         8-719-130-07 s RD3.0E
                                                                   D7
Q6
      8-729-100-66 s
                       2SC1623
Q7
      8-729-463-73 в
                       2SD637
      8-729-100-66
                       2SC1623
      8-729-216-22
                       2SA1162
                                                                   ICI
                                                                         8-749-911-54 s BX1154(SONY)
                                                                   IC2
                                                                         8-741-106-30 s BX1063(SONY)
                                                                                       s uPC4558C(NEC)
                                                                         8-759-145-58
                                                                   IC3
                                                                         8-741-107-10
                                                                                       s BX1071(SONY)
                                                                   IC5
      1-553-739-21 s KEY"SEC"
                                                                   IC6
                                                                         8-741-106-40
                                                                                       s BX1064(SONY)
      1-553-739-21 в
                       KEY"SEC"
                                                                        8-759-600-24 s M54543L(MITSUBISHI)
8-759-143-05 s uPC14305H(NEC)
S3
      1-553-739-21 s KEY"MIN"
                                                                   IC7
      1-553-739-21 s KEY"MIN"
S4
                                                                   IC8
      1-553-739-21 s KEY"HOUR"
$5
                       KEY"HOUR"
      1-553-739-21 s
      1-554-076-00 в
                       SLIDE"TC/UB"
SLIDE"TC/TAPE TIME"
S7
                                                                   L1
                                                                         1-408-298-00
                                                                                           2mH
S8
      1-554-076-00 s
                                                                          1-459-155-00
                                                                                           45uH
S9
      1-553-739-21 s
                       KEY"RESET"
                                                                   L3
                                                                          1-407-696-00
                                                                                           MICRO I'8
      1-554-076-00 s SLIDE"FREE
1-553-739-21 s KEY"LIGHT"
S10
                       SLIDE"FREE RUN/REC RUN"
                                                                   1.4
                                                                         1-407-696-00
                                                                                          MICRO 18
                                                                          8-729-100-66 s 2SC1623
                                                                   01
X1
      1-527-853-00 s OSC. 7.159MHz
      1-567-069-11 s OSC. 31.25KHz
1-567-079-00 s OSC. 31.4685KHz
X2
                                                                   R1
                                                                         1-214-178-00 s METAL 82K 1% 1/4W
                                                                          1-214-180-00 s METAL 100K 1% 1/4W
                                                                   R108
                                                                         1-247-795-00 s CARBON 33 5% 1/6W
TR-15 BOARD
                                                                   RV1 1-228-455-00 s VAR, CERMET 500
      A-6715-169-C o MOUNTED CIRCUIT BOARD, TR-15
                        WITH DU-55 BOARD
      DU-55 BOARD
                                                                   VA-16 BOARD
      1-610-849-00 o PRINTED CIRCUIT BOARD, DU-55
                                                                         A-6759-115-A o MOUNTED CIRCUIT BOARD, VA-16
      1-131-341-00 s TANTALUM 0.1 10% 35V 1-131-415-00 s TANTALUM 0.68 20% 16V
C1
                                                                                            WITH AL-6, DU-18, PG-3, RA-8 &
C4
C5
      1-131-415-00 s TANTALUM 0.68 20% 16V
                                                                          1-560-906-00 o HEADER, 10P for PCB
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Ref.No. Parts No. SP Description
                                                                  Ref.No. Parts No. SP Description
                                                                        1-214-557-00 s METAL 1K 1% 1/8W
      AL-6 BOARD
                                                                  R8
                                                                        1-214-589-00 s METAL 22K 1% 1/8W
      A-6711-458-B o MOUNTED CIRCUIT BOARD, AL-6
                                                                        1-214-589-00 в
                                                                                         METAL 22K 1% 1/8W
                                                                       1-214-557-00
                                                                                         METAL 1K 1% 1/8W
C456 1-163-141-00 s CERAMIC CHIP 0.001 5% 50V
C457 1-163-141-00 s CERAMIC CHIP 0.001 5% 50V C458 1-163-141-00 s CERAMIC CHIP 0.001 5% 50V
                                                                        TG-5 BOARD
C460 1-163-141-00 s CERAMIC CHIP 0.001 5% 50V
C461 1-163-141-00 s CERAMIC CHIP 0.001 5% 50V
                                                                        A-6711-457-A o MOUNTED CIRCUIT BOARD, TG-5
                                                                        1-163-275-00 s
                                                                                         CERAMIC CHIP 0.001 5% 50V
C465 1-131-343-00 s TANTALUM 0.22 10% 35V
    1-131-341-00 s TANTALUM 0.1 10% 35V
                                                                        1-163-275-00 s CERAMIC CHIP 0.001 5% 50V
                                                                  C3
                                                                        1-163-275-00 8 CERAMIC CHIP 0.001 5% 50V
C467 1-130-495-00 s FILM 0.1 5% 50V
                                                                  C4
                                                                                         CERAMIC CHIP 0.001 5% 50V
                                                                        1-163-275-00
C468 1-131-354-00
                    s TANTALUM 1.5 10% 25V
                                                                  C5
                                                                                     s
                                                                                         CERAMIC CHIP 0.001 5% 50V
                                                                  C6
                                                                        1-163-141-00 в
D451 8-719-100-03 s 1S2835
D452 8-719-100-05 s 1S2837
                                                                  Dl
                                                                        8-719-100-05 s
                                                                                         152837
      8-719-100-03
                   s 1S2835
                                                                        8-719-100-05 s
                                                                                        152837
D454 8-719-100-03
                       182835
                                                                        8-759-200-90 s
                                                                                          TC4538BF(TOSHIBA)
                                                                  IC1
                                                                        8-759-200-90 s
                                                                                          TC4538BF(TOSHIBA)
IC451 8-759-700-43 s NJM4558M(JRC)
                                                                  TC2
                                                                        8-759-200-71 s
                                                                                          TC4017BF(TOSHIBA)
IC452 8-759-700-43 s NJM4558M(JRC)
                                                                  IC3
IC453 8-759-200-90
                                                                                         TC40H390F(TOSHIBA)
                    s TC4538BF(TOSHIBA)
                                                                        8-759-201-32 s
                                                                  IC4
                                                                                          TC4081BF(TOSHIBA)
IC454 8-759-200-90 s TC4538BF(TOSHIBA)
                                                                  IC5
                                                                        8-759-200-84
                                                                                      8
                                                                        8-759-200-84 s
                                                                                         TC4081BF(TOSHIBA)
                       2SC2712
Q451 8-729-271-22 в
                                                                        8-729-271-22 s
Q452 8-729-271-22
                       2SC2712
                                                                  Q1
                                                                                          2SC2712
                                                                         8-729-271-22 s
                                                                                          2SC2712
Q453 8-729-216-22 s 2SA1162
                                                                  02
                                                                                          2SC2712
                                                                         8-729-271-22
                                                                                      8
                                                                  03
R845 1-247-879-00 s CARBON 100K 5% 1/6W
                                                                         8-729-216-22
                                                                  04
                                                                         8-729-271-22
                                                                                          2SC2712
RV451 1-228-476-00 s VAR, CERMET 50K
                                                                         VA-16 BOARD
      DU-18 BOARD
                                                                         1-107-159-00 s MICA 33PF 5% 500V
                                                                  Cl
      1-608-823-00 o PRINTED CIRCUIT BOARD, DU-18
                                                                  C2
                                                                         1-161-013-00 s
                                                                                          CERAMIC 0.01 10% 25V
                                                                                          CERAMIC CHIP 100PF 5% 50V
                                                                         1-163-251-00
                                                                                      8
                                                                  C3
                                                                                          MICA 13PF 5% 500V
MICA 82PF 5% 50V
X1
      1-567-060-00 s VCO, 10.73MHz
                                                                  C4
                                                                         1-107-205-00 s
                                                                  C5
                                                                         1-107-083-00
      PG-3 BOARD
                                                                  C7
                                                                         1-107-079-00 s
                                                                                          MICA 56PF 5% 50V
                                                                         1-109-694-00
                                                                                          DIPPED MICA 750PF 1% 500V
                                                                                          MICA 12PF 5% 500V
MICA 12PF 5% 500V
       A-6728-797-A o MOUNTED CIRCUIT BOARD, PG-3
                                                                  C13
                                                                         1-107-204-00
                                                                                       8
                                                                         1-107-204-00
                                                                  C14
                                                                                      8
                        CERAMIC CHIP 150PF 5% 50V
                                                                         1-107-085-00 s
                                                                                          MICA 100PF 5% 50V
C2
      1-163-255-00 s
                                                                  C15
                        CERAMIC CHIP 150PF 5% 50V
       1-163-255-00
C3
                    8
                        CERAMIC CHIP 150PF 5% 50V
                                                                                          CERAMIC CHIP 470PF 5% 50V
       1-163-255-00
                                                                         1-163-267-00 s
C4
       1-163-255-00
                        CERAMIC CHIP 150PF 5% 50V
                                                                         1-131-347-00 s
                                                                                          TANTALUM 1.0 10% 35V
C5
                                                                  C17
       1-163-239-00
                        CERAMIC CHIP 33PF 5% 50V
                                                                  C20
                                                                         1-107-078-00
                                                                                          MICA 51PF 5% 50V
C6
                                                                                          MICA 6.8PF 500V
TANTALUM 4.7 10% 10V
                                                                   C21
                                                                         1-107-048-00
                                                                                       8
                        TC40H002P(TOSHIBA)
                                                                  C101 1-131-375-00 s
ICI
       8-759-220-02 s
       8-759-902-21 s SN74LS221N(TI)
 IC2
       8-759-902-21
                        SN74LS221N(TI)
                                                                  C102 1-131-375-00 s TANTALUM 4.7 10% 10V
IC3
                                                                                          TANTALUM 4.7 10% 10V
                                                                   C105
                                                                         1-131-375-00
                                                                                      8
                                                                                          TANTALUM 4.7 10% 10V
TANTALUM 4.7 10% 10V
                        METAL 8.2K 1% 1/8W
 Rl
       1-214-579-00 s
                                                                   C106
                                                                         1-131-375-00
                                                                                      8
       1-214-557-00
                        METAL 1K 1% 1/8W
                                                                         1-131-375-00
 R3
                                                                   C109
                                                                   C110 1-131-375-00 s
                                                                                          TANTALUM 4.7 10% 10V
RVI
       1-228-458-00
                        VAR, CERMET 5K
                        VAR, CERMET 5K
                                                                                          TANTALUM 4.7 10% 10V
       1-228-458-00
                                                                         1-131-375-00 s
 RV2
                                                                   C113
       1-228-459-00
                        VAR, CERMET 10K
                                                                                          TANTALUM 4.7 10% 10V
                                                                         1-131-375-00 s
 RV3
                                                                   C114
                                                                                          CERAMIC CHIP 100PF 5% 50V
                                                                         1-163-251-00 s
                                                                   C121
                                                                         1-163-247-00 в
                                                                                          CERAMIC CHIP 68PF 5% 50V
                                                                   C123
       RA-8 BOARD
                                                                   C124
                                                                         1-107-093-00 s
                                                                                          MICA 220PF 5% 50V
       A-6711-461-A o MOUNTED CIRCUIT BOARD, RA-8
                                                                   C125 1-131-377-00 s TANTALUM 10 10% 10V
                                                                         1-163-263-00 s CERAMIC CHIP 330PF 5% 50V
                                                                   C126
       8-719-911-19 s ISS119
                                                                         1-130-479-00 s FILM 0.0047 5% 50V
                                                                   C127
 D1
                                                                                          TANTALUM 6.8 10% 16V
                                                                         1-131-370-00 s
       8-719-911-19 s 1SS119
 D2
                                                                   C128
                                                                         1-131-370-00 s TANTALUM 6.8 10% 16V
                                                                   C129
 Q1
       8-729-178-54 s
                        2SC2785
       8-729-178-54
                        2SC2785
                                                                   C130 1-109-682-00 B DIPPED MICA 240PF 1% 500V
 Q2
 Q3
       8-729-384-46
                        2SA844
                                                                   C131 1-107-210-00 s MICA 22PF 5% 500V
                                                                                          CERAMIC CHIP 10PF 5% 50V
CERAMIC CHIP 47PF 5% 50V
       8-729-612-77
                     8
                        2SA1027R
                                                                   C133
                                                                         1-163-227-00
                                                                         1-163-243-00
 Q5
       8-729-663-47
                     8
                        2SC1364
                                                                   C136
                                                                                       8
       8-729-178-54 s
                                                                         1-163-243-00 s CERAMIC CHIP 47PF 5% 50V
                        2SC2785
                                                                   C137
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Ref.No. Parts No. SP Description
                                                                  Ref.No. Parts No. SP Description
C138 1-163-243-00 6 CERAMIC CHIP 47PF 5% 50V C139 1-163-243-00 8 CERAMIC CHIP 47PF 5% 50V
                                                                  FB901 1-535-178-00 s
                                                                  FB902 1-535-178-00
                                                                  FB903 1-535-178-00
C140 1-131-377-00 s
                       TANTALUM 10 10% 10V
                                                                                       6
C142
      1-107-048-00 s MICA 6.8PF 500V
                                                                  FB904 1-535-178-00
                       TANTALUM 10 10% 10V
C145 1-131-377-00
                                                                  FB905 1-535-178-00
                       MICA 13PF 5% 500V
MICA 56PF 5% 50V
C301 1-107-205-00 s
                                                                  FB906 1-535-178-00
C304 1-107-079-00 s
                                                                  FB907 1-535-178-00
C305 1-109-690-00 s DIPPED MICA 510PF 1% 500V
C307 1-131-377-00 s TANTALUM 10 10% 10V
                                                                  FB908 1-535-178-00
                                                                  FB909 1-535-178-00
                    6
С308 1-131-377-00 в
                       TANTALUM 10 10% 10V
                                                                  FB910 1-535-178-00
C309 1-131-377-00
                       TANTALUM 10 10% 10V
                                                                   FB911 1-535-178-00
                       MICA 12PF 5% 500V
CERAMIC CHIP 470PF 5% 50V
C311 1-107-204-00 s
                                                                  FB912 1-535-178-00
C312 1-163-267-00 s
                                                                  FB913 1-535-178-00
                       MICA 100PF 5% 50V
TANTALUM 1.0 10% 35V
      1-107-085-00 в
                                                                  FB914 1-535-178-00
C313
                                                                  FB915 1-535-178-00
C314 1-131-347-00 s
                                                                  FB916 1-535-178-00
      1-107-158-00 s
                       MICA 30PF 5% 500V
С318 1-107-078-00 в
                       MICA 51PF 5% 50V
                                                                  FLl
                                                                         1-235-308-00 s LPF
C340 1-107-204-00 s
                       MICA 12PF 5% 500V
                                                                  FL2
                                                                         1-235-308-00 s
                                                                                         LPF
C505
      1-131-347-00
                       TANTALUM 1.0 10% 35V
                                                                  FL3
                                                                        1-235-189-00 s
                                                                                         LPF
C508 1-131-347-00
                       TANTALUM 1.0 10% 35V
                                                                         8-741-106-90
                                                                                          BX1069(SONY)
                                                                                      S
C511 1-163-263-00 s
                       CERAMIC CHIP 330PF 5% 50V
                                                                   IC3
                                                                         8-741-105-80 s
                                                                                          BX1058(SONY)
C512 1-109-154-00 s
                       DIPPED MICA 240PF 5% 300V
                                                                         8-759-200-60 s
                                                                                          TA7060AP(TOSHIBA)
                                                                   IC4
C513
      1-107-163-00
                       MICA 47PF 5% 500V
                                                                   IC101 8-759-201-40
                                                                                      s
                                                                                          TL8605P-S(TOSHIBA)
                       CERAMIC CHIP 150PF 5% 50V
C516
      1-163-255-00
                                                                   IC102 8-759-201-40 s TL8605P-S(TOSHIBA)
С518 1-163-255-00 в
                       CERAMIC CHIP 150PF 5% 50V
                                                                   IC103 8-759-201-40 s TL8605P-S(TOSHIBA)
                                                                                          TL8605P-S(TOSHIBA)
C519 1-107-161-00 B MICA 39PF 5% 500V
                                                                   IC104 8-759-201-40 s
                       TANTALUM 0.15 20% 35V
                                                                   IC105 8-759-240-51 s
                                                                                          TC4051BP(TOSHIBA)
C520
      1-131-342-00 s
C605 1-131-347-00 s
                       TANTALUM 1.0 10% 35V
                                                                   IC106 8-759-906-27
                                                                                          CX7970(SONY)
                                                                                       8
C608
      1-131-347-00
                   S
                       TANTALUM 1.0 10% 35V
                                                                   IC107 8-759-145-58 s
                                                                                          uPC4558C(NEC)
C611 1-163-263-00 B CERAMIC CHIP 330PF 5% 50V
                                                                   IC108 8-759-902-21 s SN74LS221N(T1)
                                                                   IC301 8-741-106-90 s
С612 1-109-154-00 в
                       DIPPED MICA 240PF 5% 300V
                                                                                          BX1069(SONY)
                                                                   IC303 8-741-105-80 s
      1-107-163-00 s
                       MICA 47PF 5% 500V
                                                                                          BX1058(SONY)
C613
C616 1-163-255-00
                   B CERAMIC CHIP 150PF 5% 50V
                                                                   IC304 8-759-200-60
                                                                                      8
                                                                                          TA7060AP(TOSHIBA)
C618 1-163-255-00 s
                       CERAMIC CHIP 150PF 5% 50V
                                                                   IC501 8-749-925-15 s
                                                                                          AFL25F15000G1(MURATA)
C619 1-107-161-00 s MICA 39PF 5% 500V
                                                                   IC502 8-741-115-20 s
                                                                                          BX1152(SONY)
                                                                   IC503 8-759-745-60
C620 1-131-342-00 s TANTALUM 0.15 20% 35V
                                                                                          NJM4560D(JRC)
                                                                                      s
C910 1-124-236-00 s ELECT 47 20% 16V
                                                                   IC601 8-749-925-15
                                                                                      8
                                                                                          AFL25F15000G1(MURATA)
C921 1-124-236-00 s ELECT 47 20% 16V
C936 1-124-236-00 s ELECT 47 20% 16V
                                                                   IC602 8-741-115-20
                                                                                       s
                                                                                          BX1152(SONY)
                                                                   IC701 8-749-939-97
                                                                                       8
                                                                                          BX3997(SONY)
C951 1-131-369-00 s TANTALUM 4.7 10% 16V
                                                                   IC702 8-759-240-53 s TC4053BP(TOSHIBA)
C952
      1-131-369-00 s TANTALUM 4.7 10% 16V
                                                                   IC801 8-749-939-98 s
                                                                                          BX3998(SONY)
                       TANTALUM 4.7 10% 16V
C953
      1-131-369-00 в
      1-131-369-00 s TANTALUM 4.7 10% 16V
                                                                   LV501 1-459-512-00 B
                                                                                          VAR. 20mH
      1-131-369-00 s
                                                                   LV502 1-459-411-00 s
C955
                       TANTALUM 4.7 10% 16V
                                                                                          VAR, 18mH
C956
      1-131-369-00° s
                       TANTALUM 4.7 10% 16V
                                                                   LV503 1-459-411-00
                                                                                       6
                                                                                          VAR, 18mH
                                                                  LV601 1-459-512-00
LV602 1-459-411-00
                                                                                       8
                                                                                          VAR, 20mH
C957 1-131-369-00 s TANTALUM 4.7 10% 16V
C958 1-131-369-00 s TANTALUM 4.7 10% 16V
                                                                                       8
                                                                                          VAR, 18mH
                                                                   LV603 1-459-411-00 s
                                                                                          VAR. 18mH
CP801 1-433-258-00 s OSCILLATOR BLOCK, BIAS
                                                                   02
                                                                         8-729-271-22 s
                                                                         8-724-375-01 s
                                                                                           2SC403C
                                                                   Q3
      8-719-104-10 s 1SS99
                                                                   05
                                                                         8-729-603-50 E 2SC403SP
D101 8-719-101-23 s 1SS123
                                                                         8-729-271-22 s
                                                                                          2SC2712
                                                                   06
D104 8-719-101-23
                    s 1SS123
                                                                         8-724-375-01 s 2SC403C
                                                                   Q7
D106
      8-719-911-19
                       188119
                    8
      8-719-911-19
                       155119
                                                                         8-729-271-22 в
                                                                                           2SC2712
                                                                   Q11
                                                                         8-729-190-12 в
                                                                                          2SC2901
D302
      8-719-100-03 s 1S2835
                                                                   012
                                                                         8-729-271-22 s 2SC2712
                                                                         8-724-375-01 s 2SC403C
D701
      8-719-101-23 s 1SS123
                                                                   013
      8-719-101-23 s 1SS123
                                                                         8-729-271-22 s
                                                                                          2SC2712
D801
                                                                   Q14
      8-719-101-23
D802
                   s 1SS123
D901
      8-719-815-55 B 181555
                                                                   015
                                                                         8-729-271-22 s
                                                                                           2SC2712
                                                                   Q16
                                                                         8-729-603-50
                                                                                           2SC403SP
                                                                   Q101
                                                                         8-729-271-22
                                                                                      В
                                                                                           2SC2712
                                                                   Q102
                                                                        8-729-271-22 s 2SC2712
                                                                   0103
                                                                        8-729-271-22 s 2SC2712
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Ref.No. Parts No. SP Description
                                                                Ref.No. Parts No. SP Description
                                                                R516 1-247-791-00 s CARBON 22 5% 1/6W
Q104 8-729-271-22 s 2SC2712
Q105 8-729-112-06 s
                      2SA1206
                                                                 R603 1-247-791-00 s
                                                                                       CARBON 22 5% 1/6W
                                                                                       CARBON 22 5% 1/6W
    8-769-193-09 s 2SK43-3
                                                                R604 1-247-791-00 s
0106
                                                                                       CARBON 100 5% 1/6W
CARBON 100 5% 1/6W
Q107 8-729-201-81 s 2SK270-GR
                                                                R701
                                                                      1-247-807-00
                                                                                    8
                                                                      1-247-807-00
Q108 8-729-602-67 s 2SA1026-7
                                                                R702
      8-729-190-12 s
                                                                       1-228-457-00 a
                                                                                        VAR, CERMET 2K
                       2SC2901
                                                                 RVI
0109
                                                                      1-228-455-00
                                                                                    8
                                                                                        VAR, CERMET 500
0111 8-729-271-22 в
                       2SC2712
                                                                RV2
Q112 8-729-216-22 s
                                                                 RV3
                                                                       1-228-458-00
                                                                                       VAR, CERMET 5K
                      2SA1162
                                                                       1-228-456-00
                                                                                     5
                                                                                        VAR, CERMET 1K
      8-724-375-01 s
                       2SC403C
                                                                 RV4
0113
     8-729-271-22 в
                      2SC2712
                                                                 RV5
                                                                       1-228-456-00
                                                                                     Б
                                                                                        VAR, CERMET 1K
Q114
                                                                                        VAR, CERMET 2K
                                                                      1-228-457-00
Q115 8-724-375-01 s 2SC403C
                                                                 RV6
                                                                 RV12 1-228-454-00 s
                                                                                        VAR, CERMET 200
Q116 8-729-271-22 s
Q117 8-729-190-12 s
                       2SC2712
                                                                 RV101 1-228-456-00
                                                                                        VAR, CERMET 1K
                       2SC2901
                                                                                     6
                                                                                        VAR, CERMET 1K
      8-729-271-22 s
                       2SC2712
                                                                 RV102 1-228-456-00
0118
Q119 8-729-271-22 s 2SC2712
                                                                 RV103 1-228-456-00
                                                                                        VAR, CERMET 1K
                                                                                        VAR, CERMET 1K
                       2SC2712
                                                                 RV104 1-228-456-00 s
Q120 8-729-271-22 в
                                                                 RV105 1-228-459-00 s
                                                                                        VAR, CERMET 10K
Q121 8-769-193-09 s
                       2SK43-3
                                                                                        VAR, CERMET 10K
                                                                 RV106 1-228-459-00 s
Q122 8-729-112-06 s 2SA1206
                                                                 RV107 1-228-459-00
                                                                                        VAR, CERMET 10K
0123 8-729-216-22 s
                       2SA1162
                                                                 RV108 1-228-459-00
                                                                                        VAR, CERMET 10K
Q124 8-729-216-22 s 2SA1162
                                                                 RV109 1-228-457-00 s
                                                                                        VAR.CERMET 2K
Q125 8-729-216-22 s 2SA1162
Q126 8-729-216-22 s
                                                                 RV110 1-228-456-00 s
                                                                                        VAR, CERMET IK
                       2SA1162
                                                                 RV111 1-228-458-00
                                                                                        VAR, CERMET 5K
Q301 8-724-375-01 s 2SC403C
                                                                                    8
                                                                 RV112 1-228-457-00
                                                                                        VAR, CERMET 2K
      8-729-271-22 s
                       2SC2712
                                                                                    В
0302
                                                                                        VAR, CERMET 5K
                      2SC2901
                                                                 RV113 1-228-458-00
      8-729-190-12 s
0303
                                                                                        VAR, CERMET 2K
                                                                 RV301 1-228-457-00 s
      8-724-375-01 в
                       2SC403C
0304
                                                                                        VAR, CERMET 1K
                       2SC2712
                                                                 RV302 1-228-456-00
Q305
      8-729-271-22 s
                                                                                    8
                                                                                        VAR, CERMET 5K
                                                                 RV303 1-228-458-00
                                                                                    8
Q306
      8-729-603-50 s
                       2SC403SP
                                                                 RV304 1-228-454-00
                                                                                        VAR, CERMET 200
                       2SC2712
      8-729-271-22
0501
                    8
Q601 8-729-271-22 s 2SC2712
                                                                 RV401 1-228-457-00
                                                                                        VAR, CERMET 2K
                                                                                        VAR.CERMET 200
                                                                 RV402 1-228-454-00 s
0701
      8-729-271-22 s
                       2SC2712
                                                                                        VAR, CERMET 2K
                                                                 RV403 1-228-457-00 s
      8-729-271-22
                       2SC2712
0702
                                                                                        VAR, CERMET 200
                                                                 RV404 1-228-454-00
                                                                                    6
Q703
      8-729-271-22
                    s 2SC2712
                                                                 RV405 1-228-457-00
                                                                                        VAR, CERMET 2K
0704
      8-729-216-22
                       2SA1162
                                                                                    6
                                                                 RV406 1-228-454-00
                                                                                        VAR, CERMET 200
      8-729-177-43 s
                       2SD774
Q801
                       METAL 1.5K 1% 1/8W
                                                                 RV407 1-228-457-00 8
                                                                                        VAR.CERMET 2K
      1-214-561-00 s
                                                                 RV408 1-228-454-00 s
                                                                                        VAR, CERMET 200
R33
      1-214-561-00
                    s
                       METAL 1.5K 1% 1/8W
                       METAL 240 1% 1/8W
                                                                                        VAR, CERMET 100
                                                                 RV409 1-228-453-00 8
R34
      1-214-542-00
                    8
                       METAL 6.2K 1% 1/8W
                                                                 RV410 1-228-453-00
                                                                                        VAR, CERMET 100
R151 1-214-576-00
                    8
                                                                                     s
                       METAL 1K 1% 1/8W
R152 1-214-557-00
                                                                 RV411 1-228-453-00 s
                                                                                        VAR, CERMET 100
 R302 -1-214-561-00
                    8
                       METAL 1.5K 1% 1/8W
                                                                 RV412 1-228-453-00 s
                                                                                        VAR, CERMET 100
 R309 1-214-559-00
                       METAL 1.2K 1% 1/8W
                                                                 RV451 1-228-459-00 s
                                                                                        VAR, CERMET 10K
                    s METAL 330 1% 1/8W
                                                                                        VAR, CERMET 10K
R310
      1-214-545-00
                                                                 RV501 1-228-459-00 s
      1-214-578-00
                       METAL 7.5K 1% 1/8W
                                                                 RV502 1-228-458-00 s
                                                                                        VAR, CERMET 5K
 R332
                       CARBON 1.2M 5% 1/4W
                                                                                        VAR, CERMET 500K
      1-210-815-00
                                                                 RV503 1-228-464-00 s
R334
       1-214-509-00
                        METAL 10 1% 1/8W
                                                                                        VAR, CERMET 10K
 R402
                                                                  RV601 1-228-459-00 s
      1-214-513-00
                     B METAL 15 1% 1/8W
                                                                                        VAR, CERMET 5K
 R403
                                                                  RV602 1-228-458-00 s
                     8 METAL 5.1 1% 1/4W
 R404
      1-214-674-00
                                                                 RV603 1-228-464-00 s
                                                                                        VAR, CERMET 500K
                        METAL 10 1% 1/8W
 R406
       1-214-509-00
                     8
                                                                  RV701 1-228-457-00 s
                                                                                        VAR, CERMET 2K
       1-214-513-00
                        METAL 15 1% 1/8W
                                                                 RV702 1-228-459-00 s VAR, CERMET 10K
 R407
                        METAL 5.1 1% 1/4W
 R408
                                                                  RV703 1-224-255-XX s VAR, METAL 100K
       1-214-509-00 s
                        METAL 10 1% 1/8W
                                                                  RV801 1-228-458-00 s VAR, CERMET 5K
 R415
                        METAL 15 1% 1/8W
       1-214-513-00
                     В
 R416
                        METAL 5.1 1% 1/4W
 R417
       1-214-674-00
                     8
                                                                        1-554-076-00 s SLIDE"NR ON/OFF"
                        METAL 10 1% 1/8W
 R419
      1-214-509-00
                    g
                                                                  TM801 1-548-119-00 s HOURS METER
 R420 1-214-513-00
                    s METAL 15 1% 1/8W
                        METAL 5.1 1% 1/4W
       1-214-674-00
                    B
 R421
                       CARBON 22 5% 1/6W
CARBON 22 5% 1/6W
       1-247-791-00
 R503
       1-247-791-00
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1-247-791-00 s CARBON 22 5% 1/6W

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Ref.No. Parts No. SP Description
FRAME
      1-608-028-00 o PRINTED CIRCUIT BOARD, FL-7
      1-586-633-00 s CONDENSATION SENSOR
 C30 1-161-021-00 s CERAMIC 0.047
CN12 1-562-080-00 o HOUSING, 2P
      1-560-006-00 o CONTACT
      1-562-081-00 o PLUG, 2P
      1-560-406-00 o CONTACT
CN901 1-509-184-31 s RECEPTACLE, XLR 3P FEMALE
                                    "AUDIO IN CH-1"
CN902 1-509-184-31 s RECEPTACLE, XLR 3P FEMALE
                                    "AUDIO IN CH-2"
CN903 1-560-999-11 s RECEPTACLE, XLR 4P MALE WITH SWITCH
"DC IN 12V"

CN904 1-562-086-00 s RECEPTACLE, 5P "EXT BATTERY IN"

CN905 1-562-083-00 s RECEPTACLE, 50P "CAMERA"
      1-562-084-11 s
                         CONTACT
      1-562-084-21 B
                         CONTACT
D901 8-719-103-15 s LED, SE304-2K
D902 8-719-103-15 s LED, SE304-2K
H901 8-825-554-12 s RPS243-2103A
                            "AUDIO/TC/CONFIDENCE"
H902 8-825-554-32 s EPS244-21 "CTL/FULL ERASE"
L901 1-464-267-00 s "TAPE END SENSOR"
M901 8-835-079-03 s DC,DNR-5900A "THREADING" M902 8-838-036-01 s DC,BHF-1904A "CAPSTAN"
M903 A-6737-112-A s MOTOR ASS'Y "DRUM"
  C1 1-102-363-00 s FEED-THROUGH 0.001 50V
  C2 1-102-363-00 s FEED-THROUGH 0.001 50V
PM901 1-454-335-00 s
                          "BRAKE"
PM902 1-454-335-00 s "EJECT"
PM903 1-454-334-00 s "FWD"
PM903 1-454-334-00 s
                          "PINCH"
PM904 1-454-340-00 s
Q901 8-729-101-14 s PHOTO-Tr,PH103-2L
0902 8-729-101-14 s PHOTO-Tr, PH103-2L
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16-4. PACKING MATERIAL AND ACCESSORY (SUPPLIED)

Parts N	lo.	SP	Description
3-673-012	2-00	Б	STRAP, SHOULDER
3-676-089	-03	8	SCREW, LID
3-676-269	-00	8	CAP(50P SOCKET SIDE), DUST
3-676-372	2-00	s	STRAP, BATTERY LID
3-678-763	-00	0	SPACER
3-678-766	-00	0	CUSHION, UPPER
3-678-767	-00	0	CUSHION, LOWER
3-687-107	-01	0	INDIVIDUAL CARTON
3-701-617	-00	s	BAG, POLY (FOR BATTERY STRAP AND SCREWS)
3-701-630	00-0	S	BAG, POLY (FOR MANUAL)
3-701-637	-00	s	BAG, POLY(FOR BVV-1)

16-5. FIXTURE (OPTIONAL)

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Parts No. SP Description
2-034-697-00 s CLEANING PIECE
3-702-390-01 s ECCENTRICITY DRIVER (4mm dia)
7-732-050-01 s TENSION SCALE (20g full scale)
7-732-050-20 s TENSION SCALE (50g full scale)
7-732-050-30 s TENSION SCALE (100g full scale)
7-732-050-40 s TENSION SCALE (200g full scale)
7-732-050-50 s
                 TENSION SCALE (500g full scale)
7-732-902-00 s INSPECTION MIRROR
8-960-097-02 s
                 ALIGNMENT TAPE, CR2-1
8-960-097-03 s ALIGNMENT TAPE, CR2-3
8-960-097-22 s ALIGNMENT TAPE, CR5-1
9-911-053-00 s
                 THICKNESS GAUGE
J-6001-820-A s
                 DRUM ECCENTRICITY GAUGE (3)
                 DRUM ECCENTRICITY GAUGE (2)
J-6001-830-A s
J-6001-840-A s
                 DRUM ECCENTRICITY GAUGE (1)
J-6080-008-A s
                  CASSETTE REFERENCE PLATE
J-6080-011-A s
                  REEL TABLE TENSION GAUGE
J-6080-013-A s
                 DIHEDRAL ADJUSTMENT SCREW
J-6086-570-A s
                  FLATNESS PLATE
J-6087-000-A s
                 DRUM ECCENTRICITY GAUGE (5)
J-6190-800-A s TENSION REGULATOR SLANTNESS
                  CHECK TOOL
J-6195-360-A s BVV-1 PB ALIGNMENT CHECKER Y-2031-001-0 s CLEANING FLUID
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